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# **ELECTRICITY FROM CARBON WITH- OUT HEAT.\***

By Willard E. Case.

The subject has such possibilities, all within reasonable bounds, that I hardly know where to commence or finish. At present we have only crossed the boundary line of that field which I am sure will be productive of tremendous results. Thermo-electricity has attracted attention for a great many years, and now and then we have heard of new inventions which led us to think that we were about to solve the problem.

As far back as 1801, Ritter noticed that a current was set up when the junctions of dissimilar metals were heated. And following down to a later date, we find that some thermo-electric batteries were constructed which really produced electrical energy at small cost, and which have been to some extent found practicable. A thermo-cell was described by the speaker before the Royal Society in 1886, which consisted of plates of tin and platinum, forming the electrodes, immersed in a solution of chromic chloride. When the cell is heated the electrolyte becomes active; chlorine, leaving the chromic chloride, temporarily combines with the tin and forms proto-chloride of tin. This chemical action generates electricity, and soon the tin is all converted into chloride and the current ceases. When the cell is cooled this temporary combination of the chlorine and tin is broken up and the chlorine returns to chromium proto-chloride. The tin, being set free, falls as a metallic precipitate to the bottom of the cell in the form of crystals, ready to react on the operation. If this cell works between 80° and 180° Fahrenheit or 538° and 638° absolute, the electromotive force at the higher temperature is about .20 volt, but the possible efficiency is less than 16 per cent., owing to the operation of the second law of thermo-dynamics, which provides that in the conversion of heat into work, the efficiency equals the higher temperature minus the lower temperature divided by the higher temperature reckoned from an absolute zero, the lat-

ter being minus 273° Cent. So that this cell is a heat engine, a reversible voltaic cell which passes through a complete cycle. It must be heated to operate, and cooled to regenerate itself. In this connection it may interest you to see in operation a more practical thermo-cell, which converts heat into electrical energy. This battery is said to consume 2½ cubic feet of gas per hour, and to generate 12½ watts.

In order to make the subject clear to those who are not familiar with it, let me say that all electricity (except that produced by water power or galvanic batteries) is obtained from carbon. That is to say, our electrical power of to-day is generated by the combustion of coal under the steam boiler, or by means of the gas engine, and through the intermediary of engines and dynamo this energy is converted into electricity. Now we all know that this conversion of the potential energy of coal into heat and then into work is a most wasteful process, owing to the intervention of the second law of thermo-dynamics already referred to; and how to overcome this law and to avoid this waste is the subject under discussion to-night. Practically, we only convert a small percentage of the potential energy of the coal into work, a large portion being wasted. It is not so much the inefficiency of the boilers or the steam engine or dynamo which converts this energy into electricity, as it is the method adopted. When we burn coal under the boiler we transform the energy of that coal into heat energy, and the moment we do this we come in conflict with, or rather become governed by, the second law of thermo-dynamics. It is an inexorable law of Nature that under the conditions in which we live a great waste must accompany the transformation of heat into any other form of energy. To illustrate, in hot-air and gas engines, a cold-water jacket is usually employed, and so raising its temperature is diverted the larger share of the heat. In the thermo-pile the junctions must be cooled by a circulation of air or water, and in Edison's pyromagnetic generator the iron tubes must be cooled by application of cold air.

In accordance with the second law of thermo-dynamics, the heat not lost which we can utilize in a given case equals the difference between the high and low temperatures used, divided by the high temperature. Now, to express this more simply, there is heat of an expansive force in everything down to an absolute zero, but under ordinary conditions we cannot economically use this heat in any machine below the average normal temperature in which we live; so, when once we set up molecular motion called heat, we only use it above the normal temperature—up to that point to which we are limited by the destruction of matter, or, as we might say, to that point at which we burn out our boilers or melt our containing vessels. And this range is but a small fraction of the total range of the heat we have produced. Lodge has shown us that the energy in a pint of boiling water, if it could be all utilized, amounts to more than half a million foot-pounds, and if the water were quite cold, and on the point of freezing, it would still contain energy of 350,000 foot-pounds of work, or one-sixth of a horse power hour in every pint. Now, coal or zinc could be burned to heat this water to a boiling point, in which case only a part of the energy between that point and freezing could be utilized, which is a small portion of the total range between the boiling point and absolute zero. But either material can be oxidized in a galvanic battery without heat and waste, and electricity produced. If we burn the coal, as Lodge has suggested, the highest temperature commonly available is that of the furnace; hence the heat should be supplied to the working substance in the cylinder at a furnace temperature. This condition is roughly satisfied in internal combustion engines, though they have many defects at present. This furnace temperature is about 2,000° above absolute zero, or 1,500° Fahrenheit, and if in this engine we could cool down to 600° above zero, or 110° Fahrenheit, we could have a possible efficiency of 70 per cent. of the whole—

$$\frac{2000-600}{2000} = .70$$

that is, 70 per cent, less the friction of

\*Read before the New York Electrical Society Feb. 24, '97.

the machine and the loss in the conversion into electrical energy, which would bring it down to something like a possible 50 or 60 per cent. The steam engine does not even approach this. Its theoretical efficiency at 300 pounds is 33 per cent, but in actual operation it is reduced to 25 per cent. Gas engines, internal combustion engines, come near this ideal. In fact, Prof. Thurston states that a cannon when being fired has an efficiency of 50 per cent.

Let it be understood that this is a law of Nature; it is inevitable under the conditions in which we live. No cunningly devised furnace or feed-water heater, or cut-off, or triple-expansion apparatus, or pyro-generator can save this heat. The most that any of these devices can do is to save what would otherwise be wasted, over and above that which we must of necessity use.

Now, the question which we naturally ask is: How are we to convert this potential energy of the carbon into electricity with the least loss? If the boiler, steam engine and dynamo are not available for our use economically, how shall we do it? We know that the voltaic battery does not act through the transformation of heat into electricity; it produces electrical energy direct. The zinc is oxidized, and the potential energy of that zinc is converted directly into electrical energy without the production of heat. The second law of thermo-dynamics is thus avoided, as no heat appears. But the cost of this zinc and the chemicals employed to oxidize it are so expensive that we cannot afford to use them. The cheapest materials which present themselves at present to our notice are coal or carbon and the oxygen of the air. And if we could convert the energy of the coal into electrical energy direct and cheaply, we could do away with our steam motors, in time, provided the apparatus was simple and practical. Now, there is no known reason why a cheap substance may not yet be found which will act on coal and develop electrical currents in place of heat, but the general tendency of late has been to discard this method and to attempt to find some stable electrolyte or bath which will act as a carrier of the oxygen of the air, conveying it to the carbon and oxidizing it as zinc is oxidized in battery, producing electricity. This electrical energy would be the equivalent of the heat energy which would be developed by the combustion of the coal in the ordinary way.

Of course, in the construction of such a cell we must be governed by the experience we have had with the galvanic battery in which the elements of electromotive force, internal resistance, etc., are involved, and by which, consequently, the output of the cell is governed; such a cell must produce a large amount of energy, be simply and easily cleaned or recharged, in order to be practical. It must be as simple and as durable to use and handle as the steam boiler and dynamo are to-day.

It may be of interest to give you a comparative illustration of what the energy of coal does to-day, through the use of the steam engine, and what it would do provided we could oxidize it in a battery without heat. The average of large electric light plants requires four pounds of coal for every horse power of electricity delivered from the dynamo to the line. That is to say, four

large stations show a consumption of 4.2 pounds per horse power hour; 49 stations, 4.6 per horse power hour, and 32 small stations 12 pounds per horse power hour. Theoretically, 175 pounds of coal will yield one horse power, or, allowing for ash, .185 pound; and of zinc, one pound used in a battery produces one horse power under a potential of two volts, including the loss in internal resistance. The cubes of these materials represent the weights required by each to produce one electrical horse power hour.

Of course the subject of electricity direct from carbon has been considered from many points of view. Some have attempted to obtain cheap electricity by using the oxygen of the air to oxidize various substances; others have attempted to oxidize coal with the oxygen of the air without heat, and others have attempted to oxidize coal by the oxygen of the air with the application of external heat. The evolution of this subject is most interesting. We will, therefore, study the question from that point of view and examine some of the most important batteries which have been constructed. We will do so chronologically. Of course, lack of time will compel me to avoid reference to many well-conceived inventions.

Passing over the carbon consuming cells of Jablockhoff, Bard, Cruum, Edison, Wright and Thompson, I will first describe the cell invented by C. S. Bradley, in co-operation with Prof. F. B. Crocker, which was mentioned in the discussion of a paper read by the speaker on "Electricity from Carbon Without Heat," in 1888, before the American Institute of Electrical Engineers.

Mr. Bradley described fully the action of fused salts on coal and stated that the oxygen of the air was absolutely necessary for the purpose of cheap oxidation, or, to use his own language: "The cell consisted of fused sodium manganate, and putting a blast of air through it, and by that means supplying it with oxygen and allowing it to act on the coal, which is put in another part of the vessel, a little over one volt was obtained."

The cell consists of an iron vessel 2½ inches in diameter, and 8 inches deep, which is placed inside of a retort and heated by a gas flame to nearly a red heat. The electrolyte of the cell is caustic soda, to which peroxide of manganese is added, forming sodium manganate. In this cell is immersed the electrode of carbon, which acts as the positive pole, and when the circuit is closed, you will see that we will have an electromotive force of about 1 volt, with a current of 3 amperes. (Experiment shown.)

The next cell to which I will ask your attention is that described by W. W. Jacques in Harper's New Monthly Magazine, in December, 1896, which is another illustration of the same principle involved in the Bradley cell, with a few practical modifications. It, like the other cell, consists of an iron vessel, which is the negative electrode, containing fused caustic soda, minus the peroxide of manganese, into which is plunged the positive coal or carbon. The oxygen is supplied by a blast of air, as in the cell before described, and an e. m. f. of about 1 volt is said to be obtained. The difference between these two cells, which I particularly desire you to notice, and

the only practical difference between them, is the addition of peroxide of manganese to the bath of the Bradley cell, and, although I have described them chronologically, I will first show the Jacques cell, and then by simply adding peroxide of manganese to it, we will have the Bradley cell. We will then be enabled to get their comparative e. m. f. and current in the same cell. But I may say in passing that experience with these cells before you leads me to believe that the theory of their action is not by any means well understood. It is most uncertain and erratic, and seems to be more so before than after the addition of the manganese peroxide. For instance, its e. m. f. seems to depend upon its temperature. If water is present when the caustic soda is first used, a reverse current becomes manifest. When air is blown through the electrolyte the e. m. f. is increased. Sometimes only .3 of a volt is obtained; sometimes about 1½ volts. But the greatest amount of current is apparent when the carbon is immersed in the bath.

When the carbon rod is drawn up along the inside of the vessel the highest e. m. f. is obtained, and when this carbon electrode is replaced by another having none of the fused electrolyte on it, and brought in contact with the exterior of the vessel, at different points where the temperature varies, no appreciable e. m. f. is obtained. This would indicate that as we drew the carbon up out of the bath against the side of the vessel, we approach a point where the critical temperature exists, and we get the highest e. m. f.

If a nickel crucible be used, as suggested by Bradley some years ago, the e. m. f. is brought up to what is considered the theoretical, as you will see. This little nickel crucible contains fused caustic soda and carbon electrode, the same as in the Jacques cell. When heat is applied, you will notice that the voltage goes up to 1.16, then begins to fall, and at a critical temperature above a red heat it drops to .3 volt, a most interesting fact, and on cooling, the voltage goes up again to 1.16, and drops again when the caustic soda solidifies. You will observe that the voltage is above the theoretical. (Experiment shown.) Many other peculiar actions will be noticed if the carbon rod is replaced by an iron one. With this form of cell it is claimed that as high as 85 per cent of the energy of the carbon consumed is converted into electrical energy. The following results of tests of the Jacques cell, taken from the article referred to, and from the Engineering Magazine of July, 1896, may be of interest: Electricity obtained from 1 lb of coal (of which 0.4 lb was consumed in the pots and 0.6 lb was burned on the grate), equaled 1,336 watt hours, or 32 per cent of that theoretically obtainable.

Another cell reported in the public prints to have been built and operated by Jacques consisted of 100 iron cells, 1½ inches in diameter, and 12 inches deep, which gave an e. m. f. of about 90 volts and 16 amperes, supplying 30 16-candle power incandescent lamps for a little over 18 hours. In this experiment it is said that about 8 pounds of carbon were consumed in the cells. This, it was stated, gave an efficiency of over 90 per cent, which, of course, did not include the power to operate the air pump and the coal consumed in heating the cells. But my experience with the cells be-

fore you leads me to doubt the correctness of these computations.

It has been suggested that carbon consuming batteries would be too bulky and occupy too much space, as compared with that occupied by the present central station for a given output. I find, however, that the Edison Station at Duane street has a capacity of 28,000 electric horse power. The cubical capacity of the building is in round numbers, 900,000 cubic feet. The same building crowded with Jacques cells, assuming that they would perform the work claimed for them, and leaving aside the question of the difficulty of their operation, properly distributed, would have an output of 60,000 horse power. This estimate is necessarily theoretical, and based entirely upon the statements made by Mr. Jacques, namely, that a furnace containing cells occupying a cubical space of 600 feet has a capacity of 40 electrical horse power. You will thus see that this ratio is in the proportion of 28 to 60 in favor of the battery. It has been stated that the e. m. f. of the carbon consuming cells is so low that they would be of no practical value. I think our experience with the storage battery in central stations refutes this idea; at least for potentials up to 250 volts, and by means of rotary transformers the current can, if necessary, be converted into any form and pressure.

These cells, if correct in theory, can be heated without infringing on the second law of thermo-dynamics, as the law does not apply so long as the oxidation of the carbon itself does not produce heat, but electricity. For, as we have said, there is heat in the electrolytes and all matter down to absolute zero, and the electrolyte in the practical operation of these cells, is simply heated to permit the chemical affinities acting. We are governed here, as elsewhere, by the laws of evolution, and I think that this question will be solved only through many attempts and many failures. I believe that we must look at this subject from a different point. In the first place, can we not learn a lesson from nature? We certainly have a most wonderful example of the conversion of potential energy of carbon direct into work in the animal economy, which is developed at the expense of the oxidation of the material supplied by the food, with an efficiency twice as economical as in the case of the steam engine. One-fifth of the potential energy is converted into work; four-fifths is converted into heat. But we must remember that the human body must be able to exist in the arctic regions as well as in the tropics, that the engine room must always be kept warm, and to insure this average temperature in all parts of the earth and under all conditions, the four-fifths of what apparently is waste energy, is necessary to maintain the race.

A day's work of muscular toil is laid down by the authorities at about 1,084,950 foot pounds. The normal daily expenditure in heat cannot be so readily determined, and it is estimated at 6,148,000 foot pounds; that is, between one-fifth and one-sixth of the potential energy of the food is expended as mechanical labor; the remaining four-fifths or five-sixths leaves the body in the form of heat. Of course, eventually the work goes into heat and is dissipated.

In the human economy the oxygen of the air is taken up by the blood in the lungs. It is carried through the arteries

and attacks the tissues, giving up its oxygen and so oxidizing them, and thus producing heat; and when work is done, the equivalent of the heat disappears as work, and when the work is not done, the temperature rises, perspiration and evaporation takes place, and the temperature is kept at its normal condition, through this safety valve. In other words, expressed electrically, there is local action, as in a battery. I am aware that the question of the cause of muscular contraction is in dispute, but it is generally admitted that the muscular force must be derived from chemical energy.

Observe, in the first place, that nature prepares the food which it consumes to perform its functions. The food is taken into the stomach and digested. A great part of it is useless, the best part is selected and is transformed into a condition in which it can be easily oxidized at a low temperature, the blood acting as the carrier of the oxygen. Does this not give us a hint that we should follow this course likewise, and prepare the material for our carbon consuming batteries? The oxygen of the air, we always have with us, so have we many carriers of oxygen, but an attempt, so far as I know, has not yet been made along this line which I suggest, except that illuminating and other gases have been used.

A cell which I will soon show you is one described by me in a paper read before the American Institute of Electrical Engineers in 1887. It consists of two electrodes, one of carbon, surrounded by powdered carbon, in a porous cup, and one of platinum, both being immersed in an electrolyte of sulphuric acid in a glass jar about one inch in diameter and six inches in height. Into this electrolyte when we introduce chlorate of potash we form peroxide of chlorine, which is a very unstable gas, and decomposes in the presence of carbon; its oxygen attacking the carbon oxidizes it without heat, the chlorine being set free at the platinum pole, electricity is generated with an electromotive force of 1.3 volt, varying with the amount of oxidizing agent present and with the kind of carbon used. Or, we can place these two electrodes in a vessel containing water, generating this gas outside the cell and pass it over into the cell containing the electrodes, in which case the cell will operate the same as before; its internal resistance being regulated by the amount of sulphuric acid which we may wish to add to the water.

You will notice that when the electrodes are immersed in the sulphuric acid, that only a slight e. m. f. is indicated, due to the combination; on the addition of chlorate of potash, the e. m. f. is about 1.3 volts per cell and the current about .4 of an ampere. To show you that the action is strong and the oxidation of carbon rapid, I will connect the cell with this little electric bell, which will give you an idea of its strength. (Experiment shown.)

We have been taught to believe that the e. m. f. due to the oxidation of carbon, is about 1.05 volts. This value has been arrived at by assuming Andrews' determination, that the oxidation of one pound of carbon to CO<sub>2</sub> equals 14,544 B. T. U.; or that one gramme equals 24,944 foot pounds. This determination was only approximate, and further, it was a determination made at a very high temperature. Now you have seen that

the oxidation of carbon in this cell without heat has produced 1.3 volts, and would produce even more if we chose to concentrate the peroxide of chlorine present, which is rather a dangerous operation, as the gas is an explosive one under some conditions. So it would apparently appear that there are more foot pounds of energy in a pound of carbon than shown by Andrews, unless the additional energy in this instance comes from the peroxide of chlorine.

It might be thought that the high e. m. f. obtained in this cell is due to the action of the nascent chlorine on the platinum, but careful measurements have determined the contrary.

We have here, therefore, a cell in which carbon is oxidized without the application of heat and at normal temperatures; a cell in which oxygen in unstable composition is readily given up to the carbon and the product of the oxidation is carbonic acid gas, as proved by analysis. I think we have, therefore, the right to assume that a large percentage of the potential energy of the carbon is converted into electrical energy. The point I wish to make in this connection is: We have in this cell, conditions which are analogous to those taking place in the human system, at least to the extent that carbon is and can be oxidized at the normal temperatures under which we live, and its potential energy converted into electricity.

We have in the blood of the human economy a carrier of oxygen, called haemoglobin; it absorbs its oxygen through the lungs, each gramme taking up 1.34 c. cm. of oxygen; this oxygen is in such unstable condition that it can be extracted from the blood by means of a vacuum and by means of most reducing agents; yet it has the power to oxidize carbon and hydro-carbons as the body provides them, without external heat.

We have in this test-tube, water containing haemoglobin in solution. You will see that by transmitted light, it is of the color of arterial blood, as it is fully oxidized, and when a reducing agent is added to it, and the air excluded, you will see that it becomes the color of venous blood, and when the air is again admitted, it takes up the oxygen and becomes arterial in color. This game can be played, of give and take and oxidizing and de-oxidizing as many times as we like. Even carbon reduces it and gives an e. m. f. (Experiment shown.)

What I want to express to you is this: In this battery which I have just shown you, carbon is completely oxidized at normal temperature by oxygen, which is held in loose combination. So it is done in the human body, and we know that to be a very efficient machine. Therefore I see no reason to think that it is necessary for us to use high temperatures. Keep without the second law of thermo-dynamics; search for a suitable carrier of oxygen or some cheap source of oxygen supply and hydrogen or carbon; or a carbon compound easily oxidized.

Does it not seem logical that by following along this line and by preparing the material to be consumed, as nature does in the human body, we may yet be able to reach the desired end with economy? Is it not probable, judging from human experience, that within the wide range of materials, some cheap means can be found? I believe it is. Like all good things in nature, it will come through

many trials and failures. The struggle for existence will perfect it, but there is no known law which indicates that we are dealing with the impossible.

#### INTERIOR CONDUITS.

Among other questions considered by the National Conference on Standard Electrical Rules, in its endeavors to formulate a single national code of rules for safe wiring, was that of plain iron pipes versus lined pipes for interior conduits. At the December meeting of the Underwriters' National Electric Association its Electrical Committee also discussed the question of interior conduits with the result that a special committee was appointed to experimentally investigate the question for the purpose of determining the best conditions for their use. Inasmuch as the cost of interior conduits is one of the largest items in electrical construction, the methods which permit of the greatest economy consistent with safety are to be sought for. It is for this reason that The Electrical World has deemed it advisable to obtain an expression of opinion on this subject from various manufacturers, consulting and constructing engineers, and others more or less directly interested, and in response to a circular letter sent to the most prominent representatives of these various branches soliciting their opinions, the following replies have been received:

Mr. William H. Merrill, Jr., Electrician for the National Board of Fire Underwriters, regrets that his connection with the insurance interests prevents him from contributing to the discussion previous to the final action of the Underwriters' National Electric Association, but sends the following notes, which will doubtless prove of interest, being the results of investigations which he has personally carried on.

"Metal Conduits—The metal covering or pipe must be at least 1-16 of an inch in thickness, and capable of withstanding a crushing load one-half as great as that necessary to break the ordinary commercial forms of gas pipes having equivalent external diameters.

"The insulating lining:

- "1. Must be firmly secured to the pipe.
- "2. Must not crack or break when a ten-foot length of the conduit is bent with a sag of two feet in the middle.
- "3. Must not absorb more than ten per cent of its weight of water during one hundred hours' immersion in pure water at 70 degrees Fahr.

- "4. Must not soften at a temperature below 200 degrees Fahr., and must leave the water in which it is boiled practically neutral.

- "5. Must be sufficiently thick and tenacious to withstand abrasion for five minutes against a 2 3/4-inch cylinder covered with No. 1 sandpaper and revolving at the rate of 1,500 revolutions per minute, the material being held against the sandpaper by a 1-4-pound weight.

"Plain iron pipe such as the ordinary commercial form of gas pipe must not be used as a conduit unless its interior surface is free from burrs and coated or enamelled to prevent oxidation, and the conductor installed therein has a covering sufficiently thick and tenacious to withstand abrasion for five minutes against a 2 3/4-inch cylinder covered with No. 1 sandpaper and revolving at

the rate of 1,500 revolutions per minute, the covering being held against the sandpaper by a 1-4-pound weight attached to the end of the wire which is bent over the cylinder through an arc of 90 degrees. This covering must also show an insulation resistance of at least one megohm per mile after two weeks' submersion in water at 70 degrees Fahr., and three days' submersion in lime water after three minutes' electrification with 550 volts. All such conduit installations must be permanently and effectually grounded.

"In the way of explanation, I would say that the cylinder used in the abrasion tests is sufficiently long to admit of a new surface of sandpaper being constantly in contact with the material tested, and differences due to a filling up of the sandpaper are consequently avoided. The instant of contact between the copper of the wire and the cylinder is given by an electrical signal.

"Over a hundred tests run according to this standard show that it is well designed for purposes of comparison. The ordinary rubber wire covering 3-64 inch in thickness and having a braided outer covering will withstand this abrasion for from 30 to 100 seconds varying with the make of the wire. Wires tested in plain iron pipes would consequently have to have a much thicker outer covering than the ordinary commercial forms in order to withstand the abrasion for five minutes, as specified. The abrasion test on the conduit lining being the same, it follows that these test specifications take into consideration the use of this material secured to the inside of the pipe or the outside of the wire, as preferred.

"It is very likely that a better standard for thickness and tenacity will be devised, though I believe it will necessarily be a laboratory standard.

"In practice it might be preferable to use standard pipe sizes for insulated conduits, instead of the ones given, in order to render their installation easy with tools commonly employed, and because mechanical engineering practice has established these standards after long experience.

"If 'plain iron pipes' are ever allowed for conduits in practice, it would seem necessary to qualify their use somewhat along the lines of the restrictions given in these test specifications."

Mr. E. H. Johnson, president of the Interior Conduit and Insulation Company, New York City, writes that he believes the insulation should be both on the conductor and in the tube, and that it is better to have two independent insulations in lieu of a "single thread." He does not believe that a thin coating of asphaltic paint, enamel or other substance will be sufficient to prevent oxidation, moisture or abrasion of the insulation on the conductor, as he believes there is no such coating of sufficient endurance. He states that an extra protective covering on the insulation of the wire, in addition to a thin coating of asphaltic paint, enamel or other substance in the tube is not sufficient, inasmuch as it simply means one insulation liable to one particular set of conditions or damage. He believes that a lead covering is a greater detriment than advantage under any circumstances, and it is not a proper or scientific way of protecting the insulation. He does not believe in having a lining for the purpose

of acting as a distance-piece between the tube and the insulation of the conductor. He believes in an insulated-lined conduit, the insulation resistance of the lining being depended upon as an additional safeguard, and that the best obtainable relation should exist between the insulation on the conductor and that of the tube, and that a coated metal tube is insufficient.

Mr. George Hill, 44 Broadway, New York City, states it is his belief that the proper form of conduit is an unlined galvanized iron pipe, installed with proper care, but he has not had the opportunity to conduct experiments which would enable him to ascertain how far his belief is justified by the facts.

Mr. H. H. Brooks, manager of the American Circular Loom Company, Boston, Mass., writes that he is "last and always in the interests of an insulated raceway having no joints or molded elbows, or, in other words, a system furnishing the simplest safe means of producing the required effect."

A prominent insulated wire manufacturer writes that as a large portion of incandescent lighting is by alternating currents, and inasmuch as it is better to have both conductors in the same conduit, individual wires should be well insulated, and if sufficiently insulated he can see no advantage of having an insulation in the tube. With either direct or alternating currents, if the wires are well insulated, as many may be run as is desired through the same conduit, the conduit only being required as a pathway and protection from mechanical injury. A thin coating of asphaltic paint seems to protect pipes from water, gas or steam better than anything else of moderate cost, and certainly should protect them from oxidation. The collection of moisture is caused by condensation due to a fall in temperature, so that a thick coating of paper or other poor conductor of heat might delay condensation, but will probably not prevent it. If an absorbent, it might prevent the moisture from dripping into the bends and traps of the conduit, but the absorbent properties would not only reduce the insulation, but hasten disintegration. If the inside of the pipe, including the joints and bends, should be perfectly enamelled by a highly insulating material, without adding materially to its cost, it would be desirable.

If a conductor is protected with a good cotton braid thoroughly saturated with a proper wax compound, there should be no danger of serious abrasion in drawing in, especially since such conductor may be made flexible by using strands of fine wires, without very materially increasing the cost. A lead encasing should be used on insulated wire where there is danger of exposure to gas, grease, naphtha or special enemies to rubber, but it adds very much to the difficulty of drawing in and if good rubber is used is not necessary, except as above indicated.

In reference to a lining acting as a distance-piece between the metal tube and the insulation of the conductor, he believes that ordinary covering is all sufficient for the purpose. He believes that rather than have an insulated-lined conduit, the insulation resistance of the lining being depended upon as an additional safeguard, it is much cheaper and better to add a little good rubber to the compound as an additional safeguard.



He believes that an iron or steel tube should be treated with that substance which will at reasonable cost best protect it from oxidation.

Another prominent wire manufacturer writes:

"It seems to me that insulating the conduit and insulating the wire is not the proper thing to do. If the conduit is to be insulated, then the wire should be bare. If the insulation of the conduit is not good enough for this, it is not good enough to be of any practical use, because with one weak place it is no better than a bare pipe. It therefore seems to be a question in my mind of insulating either the wires or the conduits, and it seems to me the proper thing is to insulate the wires. We find no difficulty whatever in underground work in pulling in long lengths of heavy cable, and see no reason why in house wiring there should be any danger of injuring the insulation when installing the wires. In putting in a system of house wiring, I should thoroughly connect all the pipes. The main danger from fire seems to be a pipe partially insulated containing a live wire in contact with the pipe. In other words, dangers of fire are to be looked for from the outside of the pipe and not from the inside, and the proper method to use is a method which will confine any arcing to the inside of the pipe. By having the various pipes of a conduit system thoroughly connected together, if any ground should occur on the negative or positive leads at the same time, then any arcing due to imperfect contacts would occur on the inside of the pipe, and the difficulty would be at once shown in the circuits by the blowing of fuses or other safety devices.

"A conduit should be made of such material as offers mechanical protection to the wires and of affording an easy method of drawing in and drawing out. It seems to me that the best thing that could be used for house work is ordinary gas or water pipe. All insulated wires to be used in these pipes depends very much on the conditions and the opinion of the engineer in charge. It is perhaps better to divide such wires into three classes: Fire-insulated wires, such as weatherproof or underwriters'; rubber-insulated wires and lead-covered wires, the insulation of which may be either rubber or fiber. If the conduit in the house is going to be dry at all times, it is my opinion that a fibrous-insulated wire is as good as any other kind of insulation, with the advantage in its favor of being cheaper. If the conduit is to be exposed to moisture, then a rubber-covered wire or a lead-encased wire is the only thing to be considered. A fiber-insulated wire covered with lead is perfectly good for places, no matter how damp they may be or how wet, as long as the lead covering remains whole.

"A rubber-covered wire, lead encased, has the advantage of two protections against moisture, the lead covering and the rubber insulation, which also serves to protect the rubber from the dangerous effects of the air, which in time causes the rubber to become brittle and useless."

Mr. J. W. Marsh, vice president of the Standard Underground Cable Company, New York, writes that he believes that the insulation should be on the conductor, and that for all practical purposes nothing is gained by having an insulat-

ing-lined tube except in the case of ordinary waterproof wire where the interior conduit might become filled with water or much condensation of moisture might occur; a thin coating of enamel would be sufficient to prevent oxidation of the conduit and abrasion of the insulation, but neither asphaltic paint or enamel will prevent the collection of moisture. If cement or paint or similar substance is used for coating the conduit, there would be more risk of abrasion than in the case of a smooth, bare iron pipe. He believes that a thin extra protective covering on the insulation of the wire would be sufficient, but does not believe it necessary to have lead-covering on the wire if limited to interior conduits used in building and so well disconnected from the underground conduits that no gases can enter the interior system; otherwise, a lead-covering is absolutely necessary. He does not believe that it is necessary to have a lining acting as a distance-piece between the iron and the insulation of the conductor if the latter is properly insulated. He believes that with properly insulated wires no additional safeguard such as an insulating lining is necessary, but that the insulation of the conductor in itself should be adequate for the service required. He believes that the iron or steel tubing should be so protected as to prevent its corrosion and with a substance that will under all conditions of heat, cold, etc., present a perfectly smooth surface.—The Electric World.

#### PRESENT AND PROSPECTIVE WORK.

Baraboo, Wis.—A \$20,000 lighting plant will be built in this city.

Memphis, Tenn.—The City Council has taken steps towards the erection of a city lighting plant.

Clarksville, Tenn.—A new electric light company has been organized here, with Col. J. F. Shelton as president.

Detroit, Mich.—The Detroit Tel. Co., according to President W. L. Holmes, has now more than 1,000 telephones in operation and are connecting at the rate of 75 instruments a day.

St. Louis, Mo.—The Merchants' Exchange (the Board of Trade) was damaged to the extent of about \$50,000 recently by fire, which is said to have been caused by defective wiring for the electric elevators.

St. Louis, Mo.—The Kinloch Tel. Co. has started laying conduits. This is the first company to comply with the underground ordinance. The first conduit will be on Eleventh street, from Clark avenue to Wash street.

San Diego, Cal.—The Home Tel. Co., recently organized with a capital of \$500,000, will erect telephone exchanges in the leading cities and towns in Southern California. The first exchange will be built in this city.

Chicago, Ill.—It is reported that the Siemens & Halske and the Ft. Wayne electric corporation have consolidated. It is not stated how the business will be conducted or whether the Ft. Wayne factory will be continued or not.

Tacoma, Wash.—The Sunset Tel. & Tel. Co. will spend about \$75,000 in Washington in improving its long-distance lines. A new line is projected across the Cascade Mountains connecting Tacoma direct with Spokane and Eastern Washington.

Battle Creek, Mich.—The State Telephone Company has about completed arrangements for building an exchange in this city, and expect to commence work in about thirty days. The Bell Company formerly charged \$48, but recently reduced the price to \$36 and \$30. The new company will put in phones for \$24 and \$18.

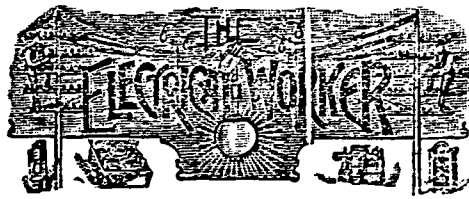
Milwaukee, Wis.—A bill has been introduced in the Legislature to compel the Wisconsin Tel. Co. to make connections with the wires of other companies. The bill provides that companies engaged in the telephone business in the State shall receive and transmit within the State messages to and from other companies engaged in the telephone business, and to furnish to such other companies connections with its own telephone exchange.

Cripple Creek, Colo.—Capitalists at Colorado Springs have organized a company to be known as the Colorado Electric Power Co., which proposes to use the power of the Arkansas River at Canon City, and transmit it to this city, a distance of 25 miles. The present consumption of power in the Cripple Creek district aggregates several thousand horse-power, all being generated at a heavy cost for fuel and water, and it is estimated that power can be supplied at such rates as will effect a saving of from 25 to 50 per cent. The initial plant will have a capacity of 2,000 horse-power.

Des Moines, Ia.—Bids for electric lighting opened a few days ago were rejected by the City Council, and new bids advertised for. The General Electric Company's bid on the basis of five years' contract, was \$9.75 per light per month for all-night lights, and \$7.83 on moon-light schedule, on one class of specifications, and \$10.50 and \$8 on another class of specifications. The city now uses 201 arc light, but under the new contract will use about 500 lights. The city is also considering using the tower system, and estimated that 140 towers will be needed. The high bid of the General Electric Company has started quite a movement in favor of municipal lighting.

St. Louis, Mo.—The Peoples' Railway Co. has been contemplating changing to an electric system for some time, as it has been losing business constantly for several years, not being able to compete with its cable system with the electric lines that have recently tapped its territory. The company has been forced to make an assignment, and Mr. Chas. Green, its president, has been appointed receiver. It is understood that he has completed arrangements to change to an electric system.

The Broadway Cable will probably also be discontinued, and electricity substituted before the summer is over. Both roads will try the experiment of using the cable conduit for an underground electric system.



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**St. Louis, Mo., March, 1897.**

**W. N. GATES, - SPECIAL ADVERTISING AGENT,**  
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Now that ladies begin to take an interest in our organization, we can expect to make more rapid progress. Our brothers in Austin, Tex., should feel ashamed of themselves. Had they the spunk and energy of "Bill 81" our Austin union would not be an unknown quantity.

Rockefeller has made another donation to the literary bureau of the Standard Oil Company, otherwise known as the Chicago University. Ten million dollars is said to be the amount of this last donation. Look out for an advance in the price of oil, as the Standard Oil Company will make this amount up with compound interest, on the people who use coal oil—principally the middle and poorer classes.

The advance agent of prosperity has taken his seat on the stage, and the show has begun. We warn Mr. McKinley that if he does not trot out his prosperity, the people will not be fooled a second time. For the sake of suffering humanity we hope that prosperity will come, and that the honest American workman who has been battling to keep the wolf from the door for many a month will at least have an opportunity to earn an honest living.

Be careful about throwing water on a fire caused by electric wires. Joseph Binkley, of Nashville, Tenn., was instantly killed on March 6 by throwing water on fire which was caused by electric wires in a building where he was working. Water is a good conductor of electricity, and in this case Binkley was grounded on an iron pipe and the hand that held the water-pail was burned to a crisp.

The National Brotherhood of Electrical Workers will pay any person who organizes a union of electrical workers with fifteen or more members, \$15. Here is a chance for our traveling members to help along a good cause, and at the same time be sufficiently compensated to at least pay their expenses. We also call the attention of organizers of the A. F. of L. and central bodies to the above proposition, and request labor papers to make note of same. For further particulars address J. T. Kelly, Grand Secretary, 904 Olive street, St. Louis, Mo.

According to a Leadville dispatch, the great miners' strike which began June 19 last, has been declared off by a vote of 3,000 to 300. Eugene V. Debs was present at the meeting at which the strike was declared off. The miners have made a hard, up-hill fight, and, although not entirely successful, they have brought the condition of the miners to the attention of the authorities of the State and the general public in such a manner that good results will follow, even though the miners are apparently defeated at present.

This month we have two new unions to introduce: Pittsburg, Pa., and Worcester, Mass. Pittsburg promises to be one of the largest and most important unions in the Brotherhood, and was organized by the organizers of the United Labor League of Western Pennsylvania and Building Trades Council. A number of previous efforts to organize Pittsburg have been made, but without success, but thanks to the good work of Bro. L. R. Thomas of the Patternmakers, M. P. Carrick and P. W. Gallagher of the Painters, Lee Hart of the Theatrical Brotherhood, and other active members of organized labor in Pittsburg, the electrical workers will now be so thoroughly organized and receive such a start that the permanent success of the union is assured.

Worcester was organized by Bro. E. Colvin after quite an effort. He writes that organizing is not the snap some people think it is.

A public test of a new wave motor was recently made at Redondo Beach, in Santa Monica Bay. Powin Wright, of Los Angeles, the inventor, conducted the experiments in the presents of twenty capitalists and inventors. By means of the float, a hydraulic compressor was actuated, forcing the water into a pressure tank under a working pressure of 400 pounds to the square inch. The water pressure tank operates a Pelton wheel, which drives any kind of machinery. In the tests an electric generator was used. With a 6x10 float five horse power was easily generated.

The machine is automatically self-regulating and is so arranged that during storm periods no more than a given

amount of power or pressure can be accumulated. The inventor states that the failure to provide such a device has heretofore rendered all wave motors useless. Further experiments will be made at a greater distance from the beach.

Wright claims that the cost of power at the coast will not exceed \$10 per horse power per annum, and can be delivered in Los Angeles for at least one-third of the present cost of power in that city.

During the past month a combine, pool or trust has been formed to control the incandescent lamp business of the country. J. H. Rhotemhamel, president of the Columbia Incandescent Lamp Company, of St. Louis, is credited with being the prime mover in forming this trust. This, to say the least, is a little peculiar, considering the fact that it was the Columbia Company that first broke the General Electric's lamp monopoly. It is further stated that all companies in the combine must pay a royalty or work under a license from the Westinghouse Company, which has revived the Sawyer-Man Electric Company, to conduct its incandescent lamp business. The companies in the trust are the Bryan-Marsh, the Perkins, the Columbia, the Buckeye, the Sunbeam, the Adams-Bagnall, the General Electric, the New York & Ohio, and the Sawyer-Man (Westinghouse).

It is also stated that the Westinghouse Company is prepared to grant licenses to reputable manufacturers of incandescent lamps. Why should any reputable manufacturer pay a license for the privilege of manufacturing incandescent lamps, when the manufacture of incandescent lamps has been open to the public for several years. It is useless to try to disguise the fact that the present combine is a trust organized like the Sugar Trust and all other trusts, to control the price of a certain article, and make the consumer pay the bills, and will not rest content until it has either forced all independent companies into the trust or out of business.

We are sorry to notice that the electrical press, with possibly one exception, approve of the formation of this latest electrical trust, and have published the plate matter issued by the trust with an approving nod.

The Western Union monopoly on the Pacific railways is about to be broken. United States Attorney Sawyer has filed a motion before Judge Munger at Omaha, Neb., for a supplemental decree to the decree originally made by the United States Court in the famous case of the United States against the Union Pacific Company and the Western Union Telegraph Company. The supplemental decree is in conformity with the mandate of the United States Supreme Court in the case filed in February, 1896. March 19 has been set for the hearing, and the time when the actual work of separating the affairs of the Union Pacific from the Western Union will be decided at this hearing. After the order is made, the Union Pacific Railway Company, by its agents and employees, and not through the instrumentality of the Western Union Telegraph Company, will exercise all the duties created by the telegraph franchise of the acts of 1862 and 1864, and the latter company is directed to vacate

all offices of the railway company. This decision opens the wires, offices and connections of the Union Pacific Railway Company to all persons and corporations on equal terms, and destroys the monopoly of the Western Union Telegraph Company along the line of the Pacific railways. This will increase the wires accessible to the Postal Telegraph Company alone nearly 2,000 miles.

When the first decision in the case was rendered not a large proportion of the telegraph equipment on the line of the road was owned by the railway company, but in the last few years, anticipating that the final decision might be unfavorable, the railway company has been building up its lines, but almost every instrument in the stations along the road is owned by the Western Union; also the greater part of the wires. It must now do its work with its own operators and its own offices.

#### "AGIN DE UNION"

"He that is not with us is against us" should be inscribed upon the banners of organized labor, and it should be displayed as a warning to our nonunion friends who say, "I don't belong to the union, but I have nothing ag'in it." For a man to remain neutral is, of course, a personal right, but for a man to remain neutral when he hopes in his heart that the union of his coworkers will succeed in obtaining for himself and others an increase in wages, better working hours, or rather some other desirable benefit, is a pretty "poor stick of a man." There is no neutral ground for a wage-worker to stand upon. He must be for or against the union representative of his labor. The simple fact that the union exists; that the object of its existence is to secure benefit to the class of labor it represents; that its platform is broad and its principles praiseworthy, destroys all possibility of any one maintaining a dignified, honorable neutrality while his co-laborers proclaim themselves as union men and wear the badge of their trade union. Therefore, every man must be for or against the union, and if any attempt to remain neutral, it is simply hypocrisy. In plain English language it is riding two horses—the employer and the union.

Every self-respecting wage-worker should be a member of his trades-union. Neutrality is cowardice. It is standing in the world of labor with arm extended and palm outspread to receive benefits and at the same time keeping a sharp eye out for danger. If the benefits reach the hand they are eagerly received; if danger appears the extended arm falls to the side and trembling footsteps are heard in a convenient alley. That is the way neutrality acts.

There is another sort of neutrality. It is that practiced by the "backslider." The neutrality which prompts a man to only pay dues to the union when there is something substantial in sight. Backsliders are barnacles which delay the ship of organized labor from reaching a safe harbor. There are also barnacles inside of the ship—men who pay dues and act as though they were ashamed of themselves, for they never speak of their union or endeavor to secure recruits. They say they are "for the union," but their daily life is against it. Is it any wonder that true-blue union men speak

contemptuously sometimes of their fellow-workers? How can a man who has the moral courage to support his convictions and express his convictions have a very high regard for a coworker who never has an opinion of his own and declares himself a "neutral," except on pay days? Pay days the neutrals receive increased wages secured by the trades-union, but conveniently forget the influence that brought the benefit to them. "Neutrals," it is time you were all doing some serious thinking—Bakers' Journal.

#### NEW YORK NOTES.

##### From the Social Reform Club.

The identification of our club with union label propaganda is very complete. The standing Committee on Organized Labor, after seeking for its sphere for a short time in other directions, settled definitely on the creation of a general sentiment in favor of union-made goods; regarding this as the most sure way to strengthen the hands of labor.

The point was brought out that label laws, giving the right to register and use labels are now on the statute books of 23 States. Hitherto, however, these labels have been attached almost exclusively to goods, overalls, etc., finding a market with the laboring classes. It will be the work of our committee to familiarize the general public with this new device, which promises a quiet adjustment through business methods of the ethical difficulties which are now troubling the minds of consumers.

Our committee reports that at the present time in this city cambric dresses, with lined waists and some trimming, are being made at \$1.20 a dozen; night-gowns, with tucked yokes (thread furnished by the maker) and insertion (cut out by the maker), at \$1 a dozen; silk waists at 98 cents a dozen; women's wrappers at 49 cents a dozen; coats are being "finished" at 36 cents a dozen; shirts are being made at 30 cents a dozen; aprons at 22 cents a dozen; fine French nightgowns are being pressed in the living rooms of tenement houses at 5 cents a dozen; and neckties are being made at \$1.25 a gross.

Dr. Parkhurst, in a recent sermon, expressed himself on the morality of the whole "bargain" question in the following manner: "If a lady goes to the store and buys an article that she is sure is marvelously cheap, and cannot understand how such a piece of hand-made goods can be procured at so pitiable a figure, she knows, if she knows anything about the world she lives in and the industrial conditions that prevail, that some poor girl in some sickly back alley has been half-paid for her work, and she, the elegant lady going shopping in her carriage, gets the benefit of it. She does not kill the girl outright, but she helps to kill her by inches. And then, when she has got the first wear out of those articles that she has paid half for and that the sewing girl has paid half of by her health, perhaps, and very possibly by her virtue, she encourages herself in imagining that she is not a blood-sucker and a murderess, by joining a relief or rescue society and packing off the unavailable portions of her wardrobe to be distributed among the poor servants girls in the back alley."

Last week's meeting was given over entirely to considering the relation of trades unions to the unemployed. Harry White, secretary of the Garment Workers' Union, had gathered a number of statistics. Of the cigarmakers in New York numbering four to five thousand, about 700 are at present idle. Each of these gets \$3 per week out-of-work pay for 18 weeks in the year. Printers are taxed one per cent of their wages for the benefit of union printers out of work. The Amalgamated Society of Engineers, an English organization, pays sick, death, out-of-work, and super-annuated benefits. The Amalgamated Society of Carpenters; also English in its origin, is equally careful of its membership. In fact, many unions are, in effect, becoming large, cheaply conducted insurance institutions, that, by reason of the intimate acquaintance of the men in the local unions, are able to go further than any insurance company in guaranteeing a living to a member whether working, idle, or sick. Mr. Tomblinson reported for the Gilders that hard times were always the promptest in affecting his union. At present 80 per cent are out of work in New York. Their union could not, therefore, promise regular out-of-work benefits. But whenever a member was in actual need of the necessities of life, he had the right to apply to the Relief Committee, which does not make an open report to the organization, but only to the officers. There is thus no humiliating publicity given to the hard-pressed man. As a fitting conclusion to the meeting, we were fully prepared to hear Mr. Devine of the Charity Organization Society assert that scarcely any applications for help came from union men. President Spahr, in declaring the meeting adjourned, said that it had confirmed us all in the belief that the gifts of the rich to the poor were small compared with the gifts of the poor to each other.

#### G. GROSVENOR DAWE.

Quincy, Ill.—It is reported here that the Postal Telegraph Company will extend its system to Burlington, Ia., and thence across the State to Omaha.

The most expensive product in the world has lately been the subject of some inquiry, with the result that the metal gallium has been put at the head of the list, with the approximate value of about \$100,000 per pound.

Receiver W. W. Fagan, of the Consolidated Electric Light and Power Company, of Kansas City, Kas., has made an order discharging all the old employees of the plant except lamp trimmers, and employed union men in their stead.

The Warren Electric and Specialty Company, of Warren, O., has refused to join the incandescent lamp pool, and has been threatened with all kinds of calamity by the trust, but is still doing business at the old stand, and proposes to continue to do so.

The recent purchase of 58,000 tons of 80-pound steel rails by the receivers of the Baltimore & Ohio Railroad Co., at a cost of about \$1,000,000, is another evidence that Messrs. Cowen and Murray intend placing the B. & O. in first-class physical condition.

## THE TRADES UNIONS AND THE MONOPOLIES.

By Geo. E. McNeill.

How can the trade unions successfully combat the giant monstrosities of the closing years of the Nineteenth Century?

The trade union is, theoretically and historically, the oldest form of the organization of the poor. It is as old and weak and as young and strong as the spirit of liberty.

The trade union is a democratic government. Its local unions were as the free cities of olden times—the saviors of civilization. Its national unions are as the union of the colonies and plantations into the States. The American Federation is as was the federation of the States before the adoption of the constitution. Trade union progress has been on the historic line of human development. Starting with the advanced members of its class, it has broadened and is broadening as rapidly as the lower-paid are advanced in material prosperity up to the level of organized effort.

The trade unions hold the position of protectorate to the unorganized, who are at first enemies, and afterwards faithful allies.

The trade unions have a membership of about 1,500,000, mostly men, and an allied force in reserve of millions of men and women of its own class. In the inevitable conflict between the people and the capitalistic monstrosities, the trade unions have the hearty co-operation of millions of farmers and many business men and other intelligent members of the community. To this force must be added the awakened religious impulse of the poor priests and clergymen.

This is the position of one of the contending parties.

The managers of the trusts, syndicates and monopolies, with their allies, the bankers, brokers, newspaper managers, rich priests and clergymen, gamblers, dudes, corporation attorneys, sycophants to power and position, and some college professors make up the active force of the other party. Their active allies are to be found in the professional politicians and in the ignorant, degraded and submerged poor of our large cities. To these must be added that class of men who live upon the vices and extravagances of the rich, and the namby-pamby, fossilized mechanics, business men and agents, who gently sink into the lower strata without a struggle. Presuming that the numerical force of each party is about equal, and agreeing that the power of aggregate wealth and the administration of political government is with the monopolists, the timid would at once conclude that monopoly was sure of the victory and that the trade unions were powerless.

It is the old, old contest that has ever been waged—the old enemy in a new form. The barons won Magna Charta from the king; the peasantry of this country won political independence from the mother country; the suffrage was won in England without the bloodshed of war, but not without the bloodshed of sacrifice.

Monopoly is the last fruit of the present industrial system. It is poisonous, but it is also seedless as it is soulless. It is the antithesis of the trade union.

It is and must be a despotism.

The trade unions seek to overcome the competition of waged workers with waged workers, in the interest of its class, and thus for all classes, by making all prosperous. The monopolists seek to overcome their competitors and make them servitors to their will.

There is no peace under despotism. The feudal barons fought each other; monopoly will contest with monopoly.

It is the function of the trade unions to create a democratic monopoly of labor. They must be the banking houses, as well as the army and navy; they must be the insurance offices and the fraternal society of laborers. The small unions must form themselves into national or international unions, and the American Federation of Labor must step forward out of its present loose form of federation into a compact government, in which the autonomy of each national and international union must be preserved. A system of revenue must be inaugurated commensurate with the seriousness of the work at hand. Guerilla warfare must be replaced with a system of scientific warfare. The allied forces must be brought into closer relations. The men who fight the battles must be fed, and, if need be, pensioned when hopelessly disabled by lock-outs or blacklisting.

Treaties, offensive and defensive, along the line of opposition to the power of trusts, syndicates and monopolies must be arranged with organizations working to this end, the trade unions holding their jurisdictions over all matters of wages, shop rules, strikes, etc.

Educational clubs must be established, under the charge of the federation, and every effort made to employ competent men to conduct educational work.

The trade unions will succeed, because democracy will prevail over despotism. They will succeed, as they always have succeeded, in the ratio of their revenue, benefits and numerical strength. Cheap men are easily purchased, and cheap unions easily discouraged and defeated. One million five hundred thousand men, with a treasury of \$15,000,000, can add a million men to the ranks and \$10,000,000 in funds. If we put none but tried, true trade unionists on guard, we cannot fail.

A few lessons in the advantages of a large circulation would be beneficial to the newspaper press, and direction should be given as to the concentration of the fight against the weakest point in the fortifications of oppression.

The greatest monopoly is the monopoly of time.

The purchasing power of a day's work is the unit of value and must be preserved. Ten years ago I wrote: The waged worker is a business man. He has time, endurance and skill to sell. If he sells ten hours for a day's work, he deprecates the unit of value; if he sells but eight hours, he increases its value. Every hour captured lessens the power of the monopoly of things.

As trade unionists within the union, we are equal stockholders. We discuss the business of how to increase the purchasing power of day's work. How to increase our membership, and how to increase and use our funds. We discuss principles and measures. Outside of the walls of the union we are still trade

unionists, and are equally stockholders in our suffrages as citizens of the United States, and are bound to wrest from the hands of individualistic monopolies those functions that of right belong to the corporate body of citizens.

Resolutions must be followed by resolution. The esprit de corps must be stimulated. False leaders and all men who trade their birthright of unionism for the mess of pottage of political pelf must be relegated to the rear. The war for the emancipation of labor is now on. We cannot win by making faces at each other, or at the enemy, or by platform denunciation. We have written platforms, amended constitutions and adopted resolutions. We have cried out, "agitate, educate and organize," and all this has been well, but now we must learn as well as teach. We must sacrifice our time, money, and, harder still, our peculiar fads, and join hands with all who will help in the struggle for industrial liberty.

My faith is unshaken—yes, grows stronger as years roll on.

I may not live to see the day,  
But earth will glisten in the ray  
Of the good time coming.

God grant that day may come in peace, as it most assuredly will, unless, intoxicated with power, the plutocracy and aristocracy of wealth shall commit the final overt act in their conspiracy against liberty.—American Federationist.

## ST. LOUIS NOTES.

The M. S. Carter Company, general contractors for the Holland Building, are doing the electrical work themselves, under the supervision of Walter Ennes, formerly bookkeeper for the Western Electric Company. Alex. Ogilvie, a suspended member of Union No. 1, was employed as foreman, and work was started with non-union men at 50 cents per day below our scale. A halt was called by the Building Trades Council. At present the electrical work is at a standstill. We are in hopes, however, that the Carter Construction Company will recognize our union and finish the work with union men. If the Carter Company intends to fight, it will be a fight to the finish, for the principle involved in this particular fight cannot be compromised.

The committee appointed by the union to draw up a contract and have it signed by the contractors, reports that they have been courteously received by all the contractors of the city, and do not anticipate much trouble in having the agreement signed by every contractor in St. Louis. Already more than one-half of the contractors have signed the agreement, and there will be a meeting on March 13, at which all contractors will be present, and it is expected that those who have not yet signed on account of a few minor points that they want to discuss, will sign at this meeting, and the agreement will go into effect April 1. This will then make St. Louis a thoroughly union city as far as the electrical work is concerned, and both contractors and journeymen will be benefited when the present cut-throat methods are ended.

The Kinloch Telephone Company has started laying conduits. The first work, of course, is all done by laborers, and it will be some time before our linemen can expect any work from the Kinloch



Company. The other companies in the city are doing no new work, and have very small forces on repair work; only just enough to keep the plants running and lines up.

Inside work has not yet opened up. This has been the dulllest winter ever known in the electrical business in St. Louis, and we can offer no inducement for traveling members to come this way, for, should there be a little revival of work in the early spring, there are enough men here who have been idle since before the election last November to handle it with ease.

Last summer, when Alexander L. Ogilvie was out of work and wanted the assistance of the union and union men, he put in his application and was duly elected to membership. Through the influence of one of our members, he secured a good position in the South installing a plant, which kept him steadily at work for five or six months. When he returned to the city he was some months in arrears for dues, but instead of thanking the union or union men for what they had done for him and settling up his dues, he branched out as a full-fledged scab for M. S. Carter & Co., and gives it as his expert opinion that putting up conduits is not part of the electrical business, and that it is not worth more than \$2 a day to do that class of work. Mr. Ogilvie has been on his uppers in the past, and may be again, sooner than he expects, and will rue the day that he traded his union principles for a pot of porridge.

#### WHAT THE TRADES UNION IS DOING.

It is the trade union which is bringing the laborers together, teaching them to know each other, and to learn their common interest.

It is the trade union which is advising the means of practical advance, obtaining higher wages, reductions of hours of labor, or checking the pressure of corporate greed upon the weak and helpless.

It is the trade union which is carrying on the agitation of great social reforms, originating legislation in behalf of the masses, and providing the means for distinguishing the friends and the enemies of labor among legislators.

In the face of these facts, measured as a test of value, the true unionist can afford to "let the heathen rave," and the followers of visionary theories claim the superior efficacy of their ideas.

Let destructionists try to tear down this work if they will—let small minds sneer and mean minds revile—the trade union needs no apology but its own achievement, no defense but the continuance of the work it has nobly inaugurated and carried on.—Ashland Appeal.

#### THERE, NOW, YOU KNOW ALL ABOUT IT.

Apergy is the name of the "force" claimed for the Keeley motor. It is thus defined: "It is obtained by simply blending negative and positive electricity with electricity of the third element, or state, and by charging a body sufficiently with this fluid, gravitation is partly reversed, and the earth repels the body with the same or greater power than that with which it formerly attracted it, so that it may be caused to move away into space."—Progress of the World.

## FROM OUR UNIONS.

### NO. ONE'S HERO.

Editor "Electrical Worker":

As our Press Secretary has found nothing to write about this month, allow me to contribute a few lines.

I have noticed in recent issues of the "Worker" that several Press Secretaries mention heroes who are members of their respective unions. We, too, can boast of a hero in the person of our President, M. L. Durkin.

Bro. Durkin was with an Edison gang at Eighteenth and Gratiot streets. John McGinness, a non-union lineman, started up a sixty-foot pole, and as he reached the cross-arm on which the electric light wires are strung, there was a flash of lightning, and he received a shock which held him to the wires. Bro. Givan jerked him loose from the wires, but was unable to hold the weight of his body, and he dashed head-foremost towards the granite street, and those who saw him fall shuddered to think of the awful death that awaited him. But our hero rushed to the foot of the pole, and bracing himself, broke the force of the fall, so that McGinness was not badly injured. I may add that some non-union men who were present, made no effort to save their companion, apparently being incapable of action, and if it were not for our heroic President, there would have been another death for the Coroner to investigate. YRAM.

### UNION NO. 2, MILWAUKEE, WIS.

For the last few months local union No. 2 has been very neglectful in writing to the Worker, but from now on I assure you that we will always be found in our regular space, and with some good words of cheer. No doubt you know of our hard struggle during the strike that has prevailed here since the 4th day of May last. We are steadily overcoming that obstacle, and our short circuits are steadily being cleared up. Circumstances made it necessary for us to take a smaller hall, but from the way they came in at our meeting last Friday night, we will be duty bound to move up one flight where we can hold all that we formerly had. We, No. 2, can be thankful to the Building Trades' Council of Milwaukee for giving us its assistance and aiding us in all manner possible. We will hold our fourth annual masquerade ball March 6, and I assure you we will not do things by halves, because everybody is with us, and heartily indorse our course.

Work here is very quiet at present, but the spring outlook is very bright.

CHAS. A. HERMAN, Press Secy.

### UNION NO. 6, SAN FRANCISCO, CAL.

Local No. 6 held its second annual ball at Odd Fellows' Hall February 6, 1897. It was a grand success. A feature of the affair was the electrical display, over 2,000 incandescent lights being used in decorating the ball room. On the stage in large globes were the initials of the Brotherhood. At each side were forked lightning; in the center was a large emblematic button, over which was a large globe; on top of it was a large eagle, from the neck of which hung a string of tiny lamps reaching to two American flags. In the center of the ceiling was

a star inclosed in a circle, from which radiated sixteen streamers of garlands studded with different colored incandescent lights. The gallery was similarly illuminated, but the grandest feature of the evening was the beautiful moon, which was only used for the pale moonlight effect for the moonlight dances, when all the other lights were put out. The people went into raptures over the beautiful effect of the pale rays, and in their ecstasy, cried aloud, "It is a real airship," but it was only the moon. The grand march was led by A. C. Johnson, our president, and Miss C. L. Kiriy. Miss Kiriy is a most charming young lady, and was a handsome sight to behold.

Bro. Black has been in town for about two weeks, but left for Honolulu to show with a vitascope, where he will remain about a month. I hope Black won't lose his heart to some of the black girls down on the islands, but there is no telling how a man might get tangled up with some of those Hulu-hulu girls.

The electrical business is very slow here at present.

E. RUSH, Press Secretary.

### UNION NO. 7, SPRINGFIELD, MASS.

I was elected, last month, to fill the office of Press Secretary, and will try to find more to write about than my predecessor. I suppose the readers of the JOURNAL think No. 7 has gone out of existence, but I am pleased to state such is not the case. We are stronger now in number and financially than we have been since we organized and are taking in from three to five new members on each meeting night, and will have this city well organized in a short time.

On Feb. 17th we invited Bro. E. Colvin, of the Executive Board, and opened the meeting to ex-members to listen to Bro. Colvin on unionism, and I expect to see all ex-members' names on the roll of honor before April 1st. Too much cannot be said of Bro. Colvin as an organizer, and No. 7 wishes him success in his efforts in neighboring cities. After the meeting we adjourned to Hotel Chandler to a banquet, and the way the turkey and other good things disappeared went to show that there are no dispeptics in No. 7.

M. FARRELL,  
Press Secretary.

### UNION NO. 9, CHICAGO, ILL.

The brother from Butte said it was so quiet over in Helena the dogs have quit barking. Such is not only the case in Chicago, but the cats have quit fighting, so that any one with a clear conscience can now sleep in Chicago at night without their peaceful slumbers being disturbed. The thugs and pickpockets are doing some skirmishing, but the police have to kill a man themselves occasionally to get up some excitement, which they do successfully every few days. The Chief of Police of Chicago, Badenock by name, should be bad enough without making such a break. He said a family of five could live on 15 cents a day in these hard times, but he, with his salary of \$300 or more per month, judging from his pauch, could not buy beefsteak enough for 15 cents to fill the smallest crevice in the northwest corner of his stomach for one meal. Such are the

stiffs workmen put in office, or help put in office, I should say. They would have you live and support a family of five on 15 cents per day.

With the electrical business in Chicago it is the old chestnut—nothing doing. The chestnut is getting hard to crack, but I think we will have to stay a while with it yet. The Chicago City Ry. is working their men half time again. The light companies are at a standstill, and all there is in sight is talk of doing that work in the spring they were going to do immediately after McKinley was elected last November.

Bro. Latham, don't you feel guilty now, after howling so much on McKinley's prosperity. There is no sane man but can see that things have gone from bad to worse, and still on the down hill grade. If you who are constantly howling at your Western brothers will show us one place on the geography of the United States where prosperity has shown itself, we will show you thousands where it went with the ground hog into its hole and pulled the hole in after it, and it promised faithfully before retiring never to return under a gold standard administration. As Bro. Hatt said, don't say to me wait, it was to come at once. Has it come? Oh, ye of great faith, how your stomachs are shrinking, as well as those of little faith.

I am glad to hear of two new babies being born into this grand body of electrical workers. Just think, Waco Lowell. Combined, they make a pretty name, but I hardly know how they are going to agree on economics. Waco, born of silver parents, will be proud of its ancestors as it grows older. Success to you, babies, may you live long and enjoy life's greatest blessings in your old age.

Now, No. 61, I feel proud of you. I saw in the Grand Secretary's report where you had increased your number, and as I was a charter member of No. 61, I am proud to say it was the first local of the N. B. organized on the Pacific Coast. I feel proud of your success, and with Bro. Lofthouse as Press Secy, I know we will hear something from No. 61 each month through the Worker, as Bro. Lofthouse is an earnest worker for the cause of unionism. I will also say this is true of Bro. Olmstead. There never was a truer Union man than Jack, even to the buttons on his clothes; if you examine them, you will find them union made. If he had but 10 cents you could have it all if he thought you needed it, and I am sorry to hear that he is out of employment so much, as there never was a more willing man to do his share of the work than Bro. Olmstead. You will never find him shirking his duty in any capacity. Now, about my card, Bro. Lofthouse, I deposited it in No. 9 about June 10, 1896, and the Rec. Secy. tells me he sent the coupon to No. 61 himself, so it must have been lost in the mails. I am sorry it did not reach you.

Now, about O. H. Budd, who did the dirty work in Wisconsin by jumping his board bill, etc. He was at one time a member of No. 9, but was suspended early in 1896 for non-payment of dues, so he was not at that time, nor is he now a member of No. 9. A man that will jump his board bill, the only thing that keeps life in his miserable carcass, in my estimation, would steal nickles out of

a blind man's hat on the street corner. Will also say that Budd, without the knowledge of No. 9, came to Chicago and went to work for a company here, but as soon as they read the Journal, they tied a can to him, and I don't think the string is broken yet in Chicago.

I was pleased to read the letter from Mrs. Mae C. Post of Grand Rapids, Mich., in our last Journal. Come again, Mrs. Post, tell us the secrets; we will be attentive listeners, and will gladly welcome you into the fold; as the editor said let us hear from more of our sisters.

I am glad to see so many of our locals represented in the last Journal. Let us hear from more of them. Wake up brothers. Come down from the gallery and take a seat in the parquet. The ladies won't bother you now that they can't wear their hats at the theater in Chicago.

Bro. Henry Hatt has gone to Arkansas to fight mosquitoes and watch the little pickaninny cat pie and 'possum. "G'way fom he'ah, chile. Foh de Lo'rd I shoot shoot you.

Good luck to you, Bro. Hatt. May success crown your efforts.

The brother from No. 45, W. H. Kelly, says where are our organizers? Bro. Kelly, if you will notice the report of our Grand Officers, the organizers have been all in the East. Notice, Bro. G. Neal's expense at Philadelphia; Bro. Colvin organized baby Lowell. Bro. Lynch, what did you organize? I think, as Bro. Kelly of No. 45 says, it would be well to dig up the cities mentioned by him. There must be some kind of a disease prevalent there, which needs a consulting physician to prescribe for. Perhaps they could do something for them. Will some one try? A. McFARLANE, Press Secy.

#### UNION NO. 17, DETROIT, MICH.

Local Union No. 17 is as progressive as ever, and we intend to keep on, and all pull together. We gave our second open meeting and smoker Feb. 16, and it was mostly attended by gentlemen of our craft. Our programme was (to use a slang phrase), "out of sight." For the benefit of locals that have never had an entertainment of this kind, I take great pleasure in describing the one given by No. 17. Meeting called to order. President Donovan in chair. Roll call of officers; reading of minutes and a good idea of the way our regular meetings are conducted; the above mentioned occupying about 20 minutes. President Donovan called Bro. Forbes, chairman of Entertainment Committee, to the chair, and turned the meeting over to him. Bro. Forbes spoke about ten minutes on the object of the meeting, and his speech was a red hot one, especially when relating to delinquent members, and we sincerely hope they will take his timely advice and climb into the band wagon again with the rest of us. The opening of the light part of the programme was made by Bro. Ellsworth, with a beautiful song, called "America's Increase in Crime," with a guitar accompaniment, and a more appropriate selection for a labor meeting would be hard to find. Next a character song by Mr. Degro, called "The East Side Sheeney's Ball," and to say he brought the house down would be putting it mildly. He kindly responded to an encore with another, entitled, "The Sheeney's Clothing Store."

Mr. Degro is undoubtedly a star of local talent, and his presence will be a pleasure to all boys of No. 17 at all of our future smokers. Next, two finely rendered madolin and guitar selections by Messrs. Wilkinson, Brown and McClure were received with great applause. Next a step dance and song, called "Sash Mula," by Mr. L. Jacob. Mr. Jacob won the boys from the start, and his songs and dances came thick and fast. As a step dancer he will rank well with the "profesh." We then gave way for 15 or 20 minutes to the enjoyments of the inner man. Good beer, sandwiches, and pickles galore were served by members and enjoyed by all. We opened the second part of the programme with a song from your scribe entitled "Better Than Gold," or "An Hour in a Pullman Palace Smoker." Then a song and dance by special request by Mr. William Healy. By special request, Bro. Conus sang "My Honey Boy," and as a burnt cork artist he has not a peer. As we had no printed programmes I have not been able to get a complete list of those who kindly aided at our entertainment, any of the gentlemen whose names I have failed to mention will please excuse me. I am afraid you will think as a reporter I am not a success. I would recommend most cheerfully an entertainment of this kind to any of our smaller locals, and if well conducted with backing of a good committee, you will be more than repaid for your time and expense with applications for membership. Applications on file for membership in No. 17 Feb. 16 was 14.

G. H. BEAMER, Press Secy.

#### LOCAL UNION, NO. 25, DULUTH, MINN.

Once again Duluth will be represented in the "Worker." For the past six months, Bro. E. J. Meagher was the excuse for Press Secretary. Bro. Meagher is an able writer, and the members of the Brotherhood have noticed for the past six months how ably No. 25 has been represented (nit). If it had not been that Eddie had so many windows to look after on East First street, we might have heard from him at least once in his term. Your humble servant will try and do a little better in the future than has been done in the past.

Business is at a standstill in our city, and there are but very few of the brothers working. The L. K. Comstock Company of Chicago made an assignment on February 3. They have a big job in Duluth under construction—the Fowler Block. Some of the brothers that were working there felt a little uneasy at first, but it turned out all O. K.

On January 20 last something a little out of the unusual happened in Duluth among the electrical workers. Bro. J. D. Hayes, our worthy past president, and Miss Bertha Grumpman were united in marriage. The ceremony was witnessed by a large number of friends of the contracting parties. After the ceremony a wedding breakfast was served at the home of the bride, at which a large number of the brothers participated. All the brothers extend congratulations and best wishes to the young people. I will lay my spurs away; it is twenty below zero.

F. A. SCHULTE, Press Secretary.

B. & O. S. W. train No. 5 the other day ran 168 miles in 176 minutes.

## UNION NO. 26, WASHINGTON, D. C.

Once more this union is in mourning. Joe Woodworth, who has for many years been an able electrician, a good union man and a hale fellow well met, has gone to make peace with his Maker. He leaves a noble wife, five beautiful children, fifty-five union brothers, and a host of friends to mourn his loss. Joe was well liked by all who knew him, for he was a gentleman in all his actions, and the first man has yet to cast a stone at his fault and weakness. None of us are perfect. He was taken sick Wednesday, January 20, and after eleven days of suffering with a severe attack of pneumonia, he breathed his last. May all be peace with you now, kind friend and brother. It was with bowed heads and sorrowful hearts that a few members gathered at the hall Saturday night to perfect the necessary arrangements relative to laying away another brother. During the short session, the charter was ordered draped for the fourth time since it was hung in its present place, on the 15th day of last April. Committees were appointed to assist the family; to draft resolutions, and to attend the funeral. Nearly thirty dollars was raised by donations for the immediate relief of the sorrowing wife and children.

The trade this week promises to be much better, and from the outlook it is thought that the men who have so long been on half time will once more be able to get in a full week and a full pay.

John R. Galloway, who was the successful bidder for illuminating the hall for the inaugural ball, will start that work, and as was naturally to be expected, the successful bidder would not only have that work, but would be deluged with other work as well. Nothing succeeds like success.

C. Schneider's Sons is the next busiest firm. They have so far been able not only to keep all of their old hands on at full time, but have been working one and sometimes two extra men.

Ex-brother Jack Lloyd, who has just completed wiring the National Hotel, is still busy working one or two helpers running lights into the adjacent stores around the hotel.

Royce & Mareau report having closed the contracts for several quite large jobs, but it will be several weeks before they are ready for the workmen.

No. 26 has been honored by adding to its membership several linemen. We are glad of this, and hold out a welcoming hand to all of them. There is a goodly number of linemen in this city who might bury the hatchet and come into our castle halls and smoke the pipe of peace with us. We have the pipe already filled with choicest Havana awaiting their coming; the bars are down; our latch string is out, and a comfortable chair in a cosy corner awaits all who will come in and share our hospitality.

M. O. SPRING, Press-Secy.

## UNION NO. 36, SACRAMENTO, CAL.

Having been elected Press Secretary at our last election, and having failed to have a letter in the February issue, the boys of No. 36 promised me such a shock as I never got before if I neglected to represent them in the March number. Not being much of a scribe and this be-

ing my first letter, you will have to excuse me if my light is not as bright as other writers for the Worker.

Work is slack in Sacramento just now, but the boys of No. 36 cannot complain as nearly all of them are working. A number of the boys went to San Francisco on the 6th of last month to attend the ball given by our sister lodge, No. 6. They all report having a good time and the ball a success, and give the boys of No. 6 great praise; also greatly admired the electrical display.

Sacramento boasts of three electric plants and two telephone companies. The city was talking very strongly of building its own plant for city lighting, thinking it would be cheaper, but it has since been decided to give the lighting to the Folsom Power Co., same as heretofore.

We intend to give a picnic this spring and expect to make it the picnic of the season.

There has been another lineman killed here, making the third in about six months. This time a young man about 27 years of age, named Fred Stutz. He was in the employ of the South Yuba Co., and met with a violent and sudden death on Feb. 24th, while employed with other linemen in running an electric wire down an alley between J and K streets. Stutz was on top of the pole splicing a wire, when his companions were horrified to see him drop to the ground, and when they rushed to his assistance, found him dead. Two large burns in the middle of his hand indicated the cause of death, two thousand volts of alternating current having passed through his body. He was a good lineman, and had been accustomed to wearing rubber gloves, but as it was a warm day, he did not have them on. He was at one time a member of No. 36, but at the time of death was in poor standing, having become delinquent. He was also a member of the I. O. O. F. and that order took charge of his remains and shipped them to Sissous, Shasta Co., Cal., where his parents reside.

I think the Union a grand thing for the boys, and am sorry so many of them are so careless about paying up their dues and let themselves go delinquent.

R. A. FISK,  
Press Secretary.

## UNION NO. 40, ST. JOSEPH, MO.

As I did not get anything in the last "Worker," I will try and get to the front this month. We are proud to say that No. 40 is adding new members right along. We give them a hot reception when they come in, so that they will get out and bring in others to get even, and in this way we always have a good house each meeting.

The Telephone and Light Company seem to do a good, steady business, and all the boys are working. The St. Joseph Light, Heat and Power Company has made a proposition to purchase the city electric light plant. The City Council is now considering the proposition. I do not know how they will consider it, but, for myself, I think it would be a good thing for the city to sell the plant to the railway and light company, as I think the city could get the street lighting done cheaper than at present. One thing, if the L., H. and P. Co. get the city plant, it would make electric work good here for awhile, in the way

of rebuilding and extending lines, etc., and in operating the plant would employ just about the same number of men as at present.

We also have a new construction company in town, Messrs. Stuart & Hughes. Good luck to them, and may they prosper in business. As President McKinley now has his seat, let the good, prosperous times, promised, come, so that we can all have work and money, and enjoy life, for we have had hard sliding for a long time.

W. C. SNODGRASS, Press Secretary.

## UNION NO. 44, ROCHESTER, N. Y.

I am not going to take up much of the "Worker's" space with my letter, as there is not much news to tell, except that No. 44 is still in the land of the living and holding her own. I guess, with any of them. The boys are all well at present, and are all working, although there is not much work to do; but it is a well-known fact that a very little work will last a very long time, if necessary.

I notice, according to Bro. Kelly's letter in the January "Worker," that Local 45 must have as members some children, and small children, at that, to whom a trip out of their native burg without a chaperon or guardian is dangerous, as it gives them a case of swelled head.

I explained in my first letter to the "Worker" the reason that the Press Secretary at that time did not do justice to the ball, and that would cover the omission of the fact that some of the members of 45 had attended it. It is a well-known fact that a new broom sweeps clean, and if the new brooms did not get anything worse than Cupid's darts in their breasts they will recover, I guess, all right. Well, as Bro. Kelly feels sorry, and as I accept his invitation to call upon him at some near future date, we will let it blow over and take it up when we meet.

FRANK GRAHAM, Press Secretary.

## UNION NO. 48, FT. WAYNE, IND.

As we are away from No. 48, and only a few days ago received our Workers, and as we notice our Press Secy. hasn't had any letter in the Worker lately, and as we have a little spare time, we thought we would break the ice, and let it be known that No. 48 is slightly disfigured but still in the ring. Bro. Dan Binkley came in the other day like he always comes in, on the hummer, and left with Foreman Krauss for Kendallville, together with several of the boys, and reports that he has the only pebble on the beach, but Bro. Criger says he isn't so hot. Some of the boys are not working at present, but expects things will be O. K. in a few days.

We learn that Bro. McAfee came very near losing his life the other day. During high water at Fort Wayne he was tying some wagons that the water was about to take away to trees, and, losing his footing, fell into the river. Had it not been for prompt action of friends, Bro. McAfee would be no more, but his pal says he will be all right in a few days.

We are rebuilding the Home Tel. Co. plant here, and the job is good for two months at least, or rather until the blue birds come again. We are all satisfied here, as we have a good boarding house, and the landlord has fixed us a nice club

room, full of nice reading matter. Who could wish for more these hard times? We have confidence now, and expect prosperity in about four days (nit), says Bro. Will Kraus.

As we have inspected the circuit and found it closed, we will now turn on the juice  
BROTHERS OF NO 48.

#### UNION NO. 49, BLOOMINGTON, ILL.

Since my last letter, the firm of Lemons & Carlton, electrical contractors, has dissolved partnership. Both parties are union men. Mr. Carlton has assumed the responsibilities of the aforesaid concern, and can be found at the old stand.

From information at hand the number of electrical workers in this city will be lessened, as our former associate pole climber, Wm. Witty, is to furnish a certain publication of Chicago copy at 3 cents per line. Luck to you, Bill, in your new venture. Anybody wishing a copy of the "Bulletin" free should call on or address Bro. Wm. C. Gorey, as I noticed in a recent issue of said sheet something to that effect. The "Bulletin" is a hot free silver advocate, so dip in, boys.

I take great pleasure in announcing Bro. Snyder's "Paper Wedding" on March 22, 1897. Anything, from a paper of pins, to a paper car wheel, goes, so I am told.

"Oh, what a tangled web we weave, When first we practice to deceive." Or, in other words, "the cat is out of the bag." It happened thus: "Hello. Gime No. 48. Is Butler there?" "Yes." "Hello. Is this Butler?" "Yes." "Where will I unload that cabbage?" "What cabbage?" "That load of cabbage your wife ordered?" "This is a mistake. I am not married." "Ain't you John Butler?" "Yes." "Don't you work for the Citizens Gas & Electric Light Co?" "Yes." "Well, that's who it's for." "Well, this is a mistake. I am not married." By this time all the people in the office were "on," and Butler got the laugh. I have every reason to believe this is a joke, but I will ferret out the mystery and report later.

E. E. HIGGINS, Press Secy.

#### UNION NO. 52, DAVENPORT, IOWA.

As my letter got in too late for publication last month, I will try again this time, earlier.

Our dance came off Feb. 20, and while it was not a success, it was by no means a failure, for it netted a small amount. Can't say just how much, for all members have not yet settled up. Our display was a sad disappointment to many members on account of its smallness, but the people who came to see it were pleased and satisfied, although I must say it looked cheap compared to what the Quincy brothers gave, as per description in the last Worker. But we are very young, have only a few members, and are very, very poor, and did the best we possibly could under the circumstances. We have the merchants and business men to thank for financial support by buying tickets, or otherwise we should have a loss to make up, instead of a little money ahead, for the attendance was small, which was not to be wondered at, so many dances coming in a bunch. One thing I regret very much, is that at our last

meeting a quorum was not present, so we could do no business, and could say nothing for the Union, but hope to later. But all the officers and members present asked me to thank the gentlemen who kindly assisted and helped to make our first ball a success, especially Manager Young of the People's Light Co., who kindly allowed us, that is, the unemployed boys, to use the company's workshop and material; the Tri-City Electric Construction Co., for material borrowed; and Manager Mullen of the Davenport Power & Light Co., who kindly furnished the power for our display, and offered anything he had we needed, and also sent a man to connect up and help finish work at the ball. These gentlemen have shown by their actions what we were much concerned to know, viz.: that they have respect for us as Union men as long as we act as men, and I for one hope that no member will ever forget that because he is a union man there is all the more reason why he should be honest and conscientious in that he will be noticed more by his employer. I have noticed that occasionally a man thinks because he has joined the Union he can do as he pleases, and can dictate to all the rest of the world. This is one of the saddest mistakes that can possibly be made, for Unions are organized to elevate a trade or craft to a better condition, not only financially, but also morally, and the moral condition regulates the financial, if I am right, which I believe I am. Then sometimes a man imagines that to be a Union man implies that he is capable of anything, and that he should know more than the "common herd," so to speak, which is another mistake, for I have known men belonging to Unions who were not capable or competent men by any means, who stirred up much strife, and made a great deal of trouble, causing the loss of large sums of money to the employer, as well as to the employer. I hope we may always be able to avoid trouble and have the respect of the people who employ us, and show the world generally that we appreciate fair treatment, and still retain our self-respect and manhood as free men, and not as slaves.

I would like to hear from other Press Secretaries on this subject, for I don't think the Worker is printed simply to tell of the success of a certain ball, or to cross swords. As Union men, let us be brothers, not politicians. Of course we must learn how to vote, but we can't help any one by hard names or force, and force is one of the things we want to do away with in such matters.

Now, I want to give you a little news. I am not much at gossiping; those who know me best say I am of little use at anything. Sorry, of course, but can't help it now. Too old.

Bro. Elliott, a member of our Union, was married last fall to an operator in the Central Union Exchange at Moline. They went to housekeeping in Rock Island, and everything seemed to be going as merry as wedding bells, for George showed up occasionally beaming happily, and seeming to grow longer and larger than ever, until recently, when he shows up one day with a careworn expression on his face, and on being questioned said his wife had gone home sick, and that his sister was dying in Decatur; that he was out of work and wanted to borrow a little money. Our president,

who is large-hearted (yes, and large himself), was about to lend him \$20, but on second thought told him the best thing he could do was to stay home with his wife, as he was out of money, with no prospect for work. But this didn't seem to meet with Bro. Elliott's approval. He came over to Davenport and saw Wilson, the Postal Tel. Co.'s division man, and inquired about a certain foreman for that company, borrowed \$5 from another brother and went home, and that was the last seen of him; but the following morning the whole trouble came out. He called up Bro. Baker, the Central Union Tel. Co.'s inspector, and told him that he would never see him (Elliott) alive again. That he was going to drown himself in the dark, cold waters of the Mississippi River. He left instructions how to get into his house, took three suits of clothes and all his tools and disappeared, presumably to the bottom of the icy river. They broke into his deserted home in the morning and found letters strewn around promiscuously, some addressed to no one, and some to his wife. Those to his wife were pathetic, indeed; yes, and very poetic, telling tales of scorned love and blighted hope. The others were a repetition of those to his wife, with a little less poetry, disposing of his household effects, which, by the way, the city authorities are holding, awaiting instructions. In a day or two a telegram came here from Kansas City saying Geo. Elliott had written there for work, and that he was at Decatur alive and well after his chilly (fake) bath. Now, George, be good, and don't give us another scare like that, for we are troubled with heart failure,

J. H. CLARK, Press Secy.

#### UNION NO. 60, SAN ANTONIO, TEX.

Outside of the fact that in the Directory of Local Unions can be found the advertisement, or mention, of Local No. 60, located at San Antonio, Tex., U. S. A., and giving the names of the officers, little else of information can be gleaned of that wonderful aggregation of electrical luminaries whose personal make-ups constitute No. 60's greatest worth and interest. For some time past, owing to the fact that No. 60's Press Secy. seems to have crawled into his hole and drawn it in after him, we have not been heard from, and consequently your readers have had no means of knowing just how No. 60 has been progressing. With an exciting election; with members of all shades of political complexion, deserving candidates ranging from a Mary Lease to a Tom Watson; with a good sprinkling of Bryan men amongst us, you can readily understand how hard it was during such trying times to get a quorum. Well, we have passed through all this, and now my mission is to try and apprise as best I can all of No. 60's friends who have made kindly inquiries if we were still in the land of the living, that we most emphatically are, and that we can be counted on to be heard from, even if some of our big dogs don't play in our back yard now. On last Thanksgiving eve, we gave a smoker. It was all right, and with an orchestra the finest the committee could for money obtain, advantageously placed out of sight, not of sound, behind the instruction blackboard, which under the glare of the



electricians showed its little service, and which bore this strange legend inscribed on its black background: "Don't spit on the floor." As No. 60 is an association of gentlemen only, this is readily understood to be non-applicable to us, and especially directed to the notice of the other unions which use the same hall. No. 60's members to a man refrain from the use of tobacco in our dearly beloved meeting place, but we do sometimes rush the can, or rather have the keg sent up to us, and we have several brothers who are experts at drawing the fragrant brew of Gambrinus. Well, as I said before, we gave the smoker, which, by the way, was to be in lieu of our annual ball, and the hall was gay with our revelry. The orchestra was banked behind the blackboard, and from behind which such entrancing music was wafted that before long all hands were waltzing. Such stag dancing; never was there such a variety of steps. The most famous dancing master could not conceive them all. Well, we had all manner of amusements, from speech making to prize fighting, and as we only had six rattling four-round matches, you all know we had something before us to interest us. Instead of a smoker, we missed it in not selling tickets to a sporting carnival, for such it was. We had athletes of all kinds. No. 60 has quite a number of active members, and I don't believe they could be much improved on by professionals. We had all kinds of refreshments, and the leading officers of the various electrical concerns graced the occasion with their presence and good fellowship, and the evening was voted a grand success by all except the bruised gladiators.

Our annual ball, which was deferred until Valentine eve, will soon be a thing of the past. I shall give a description of it in the next Worker. It will be one of the grandest affairs No. 60 has ever undertaken. Stupendous in its magnitude, the committee of arrangements are leaving no stone unturned to make it the success of the season. The elite of the city will be there, and the electrical displays will be fairly dazzling. Such quaint designs as are put before our inspection quite baffle our understanding as to how our boys ever thought of such conceits. The design of Venus and Mars in horoscope is especially beautiful. It is the creation of Bro. James Parsons. Bro. Jim is so modest, he don't want his name in print, so I put it in writing. When it comes down to electricity, though, don't touch him. His brain is one electrical maelstrom, anything and everything electrical, and he'll have his cards printed, let us hope, some day. The eclipse of the sun is also his creation, equally dazzling. The ohs and ahs which await Jim's expectant ear will recompense thee, Jimmie, old boy, for that tired feeling, and take Hoods, and only Hoods. Bro. Wellage, indefatigable Joe, has charge of the light committee, and there will be a few extra volts to spare, you bet. Joe will see they have all the light and power they want, and keep a few volts and some amperes in the closet in case the supply gets low, but I am giving you the account of this before it's happening. This won't do.

We have new material on deck. No. 60's officers, while green in their respective positions, are old and tried boys, and are all right, and I expect great results from their management of No. 60's

affairs. We took in one new member, and have out several applications, which will mean several new members. Nearly all the members are working, and we have given employment to eight or ten roller coasters this winter who were heading for everywhere but Chicago and the North and cold weather.

As this is my first letter, I hope it's all right. If not, why, it's all right anyway. I'll sail under a nom de plume. I allers hankered after one of them thar plumes, so here goes.

NONDESCRIPT.

#### UNION NO. 61, LOS ANGELES, CAL.

It requires somewhat of an effort on my part to write something of interest to the boys in general, as in the country in which we live nothing of an excitable nature occurs but once in a lifetime. I presume you all know that our city is known by the name "City of the Angeles." I want to say right here, if the glorified Angeles in the world unseen are to be compared with those of our city then you who have unintentionally sworn in seven different languages because the circuit upon which you were working was suddenly closed without due notice, may console yourselves that it is much more comfortable and safer to be under the immediate control of His Satanic Majesty than otherwise. Now this by no means infers that you must court the aforesaid gentleman, but on the contrary, at all times live up to the Golden Rule.

I often think how little attention is paid to the vow which we took on joining this noble Brotherhood. Let us one and all from this on endeavor to do as we would be done by. Do not insult nor deride a man of our craft simply because he refuses to join us at the first invitation. He can be reached when the proper season arrives, and when we have them one and all within our ranks then and not until then can we expect recognition from our employers generally.

I cannot report any improvement in the electrical business. This much I can say that there is a deal of work being laid out to be prosecuted in the near future.

The old Main Street and Agricultural Park horse car line is being rapidly converted into a first-class trolley system. I believe it comes under the wings of the Los Angeles Railway Co., which practically controls about all of the street railways of Los Angeles. This, generally speaking, does away with all of the old-fashioned street locomotions. The horses are to be turned out to grass, and the cars are to be converted into fire wood.

The Terminal Railway Co., a system of no large extent, reaching three important points from Los Angeles, Glendale, Pasadena, and San Pedro, contemplates an early change of locomotion in their entire system. It will be overhead trolley. This in connection with a deep water harbor to be established at San Pedro, will no doubt give the many unemployed an opportunity to earn an honest livelihood. God speed prosperity, and let Hanna take care of charity.

Bro. Coburn has severed his connection with the 'phone and is now railroading for a change. Bro. Peters left a few days ago for the north, in search of better fields to ply his vocation. Bro.

Huff is again at work, after being laid up with the la grippe. Bro. Viall thought perhaps a trip back to childhood days would benefit him, but alas, it was anything but pleasant; Charles has just recovered from a two weeks' illness—mumps. Bro. Yearsley, who has been nursing a touch of the la grippe, is again loaded for duty. This was not the worst of it, for when he reported for duty he was told his place had been filled. This was done by the Los Angeles Light Co.

C. P. LOFTHOUSE,  
Press Secretary.

#### UNION NO. 67, QUINCY, ILL.

One more spark from No. 67. Everybody is still enjoying good health, so far as we can learn. There has been some change since our last letter. Bro. Eddie Nessler has been appointed Rec. Secy. to fill the vacancy caused by the death of our late Bro. S. L. Pevelhouse. Last meeting night was his first night on duty, but he is to be congratulated, as he performed the duties of his office with dispatch and credit. We added another light to our circuit at last meeting, and considered another application, but there are still a few hanger boards left, so we can put on as many more as we have a chance to test, and there are others in our city whom we would like very much to connect with our circuit. Push and energy will perhaps get them sooner or later. Our little union seems to be getting down to business now in the right manner. Some of the boys had a chill last meeting.

Bro. Henry Korten is again in our midst. Henry is a strong union man, and an O. K. lineman. There are a few linemen here working for the Bell Tel. Co. whom we will try to get into the union soon.

We are glad to see the wife of Bro. Wm. Hickman out again. She has been sick for a long time, and for several months was confined to her bed. She was able to be up town a few days ago. Every one who knows her is her friend. Bro. Hickman himself looks well and hearty.

On going down town to-day we heard the clatter of a horse coming at a break-neck speed. We looked around, and behold, there it was, sure enough, a horse, a vehicle, and a driver—Bro. Walter Dasbach. Prosperity must have "struck him where he lives," eh, Walter?

At last meeting we appointed a committee of three to the Building Trades Council to reorganize on March 8. They are Bros. Joe Weinhoff, E. Nessler and C. H. McNamee. How can the thing fall through with a committee like that from the Electrical Workers?

It is reported that Bro. Geo. Mallinson saved a lady's life in the most heroic and unthought of manner. She was standing near a pole, never dreaming of danger, "poor thing," when Bro. Mallinson went up to her and very politely informed her that she was standing in a dangerous place, as Bro. L. O. Coustantz was working directly over her among a lot of live wires. Of course she yammered, and George walked away feeling better. Bro. D. M. Mallinson handles the Fin. Secy. books like an old timer.

Bro. Wagner, our President, is getting the wire edge worn off, and seems more at home in the chair now.

Some of the boys thought the T. H. Lt.

& P. Co. should have hired a union man in our late Bro. Pevehouse's place, but when it was explained by the superintendent, Mr. F. A. Parker, we, as a body, are satisfied. The man they did hire has his application and the necessary V. in, and was voted on last meeting. Mr. Parker is very friendly to our Union, and all of his men are union men, which we all appreciate.

I would like to have a letter from the P. S. of St. Joseph, Mo. Write me and I will surely answer. I used to go to that city myself.

I must tell you about the burial of our late brother, S. L. Pevehouse. He was a member of the I. O. O. F. Also of the Modern Woodmen. The funeral services were held at the house at 10:30 a. m. There was quite a good many in attendance. At 12:30 p. m. the remains were carried to the hearse by three Woodmen and three Electrical Workers. Both Woodmen and Electrical Workers marched to the depot ahead of the procession. The remains were shipped to Coatsburg, where the Odd Fellows took charge of everything. The Electrical Workers' floral offering was a handsome clock, about three feet high, with golden hands and figures. The hands pointed to the hour of the fatal fall, 9:45. As for insurance, I believe he carried \$3,000 in the Woodmen.

C. H. McNEMEE,  
Press Secretary.

#### IN MEMORIAM.

Resolutions of condolence adopted by the National Brotherhood of Electrical Workers of America, Local Union No. 67, Quincy, Ill.:

Whereas, The Great and All-wise Ruler of the Universe has seen fit in His infinite wisdom and divine providence to remove from our midst our beloved brother, Samuel L. Pevehouse; therefore, be it

Resolved, That while we submit in humility to the wisdom of our Creator, that in the death of our brother, his wife, father and mother mourn the loss of a loving husband, a kind and affectionate son, and his friends an upright and respected associate, and be it

Resolved, That we, as members of Local Union No. 67, tender our heartfelt sympathy to his wife, parents, relatives and friends in their great sorrow, and commend them to Him who doeth all things well; and be it further

Resolved, That these resolutions be spread upon our records and a copy presented to the family of our brother, and the same be published in our official journal, and that our charter be draped in mourning for thirty days.

C. H. McNEMEE,  
WM. V. HICKMAN,  
J. H. NESSLER,  
Committee.

#### UNION NO. 69, DALLAS, TEX.

I take great pleasure in informing my brother-workmen that our little band of workers are still in existence and are ever trying to induce our fellow-workers to join and assist us in our effort to secure our just rights, and to elevate and educate our craft to a higher plain.

The hard times have been a great drawback to us, for there are many who would come with us if they had work and were able; while others are afraid of their job, and you cannot well blame

them when it means almost starvation at their very doors, and that alone, I am sorry to say, has caused many a man to ever work against union men and labor organizations.

The main contract for the Catholic Hospital here was let to a Kansas man. Too bad they had to go out of the State, but we expect Texas labor to be employed, and union, at that.

The boys say, keep shy of Dallas, if you don't want to starve, and I believe they are good judges, too.

Bro. W. F. Emerson of No. 49 was with us February 20. There being no prospects here, he left for the North.

Come again, sister. We welcome you to our craft, and know it will be the means of building up and strengthening our order.

CHAS. TROTTER, Press Secretary.

#### UNION NO. 72, WACO, TEX.

We are new, but we mean business. We have had two meetings. We meet second and fourth Wednesdays at Labor Hall. We had 14 charter members and three applications for membership at our last meeting. All the brothers of No. 72 are in dead earnest, and all have good jobs, and if any brother should come down to Texas and Waco, he will find No. 72 ready to lend him a helping hand in getting work if there be any to get. There is not much work going on in Waco at present, but one brother stated at our last meeting that the Waco Electrical Supply and Construction Co. has made a contract with Dallas for fire alarm and burglar alarm inside and outside work complete. Mr. C. W. Hobson is manager of the company, and a gentleman in every sense of the word. Mr. Hobson told one brother that he would give him a job just as soon as the work commenced, and I understand that there will be quite a lot of work in Dallas this summer, and if any brother is coming to Texas, he might meet up with some of it, and I assure him that Bro. Trotter will lend him a helping hand in getting work, for I have known Bro. Trotter for a long time, and know that he is a gentleman in every respect.

We have three more applications for membership, which makes 20 in all, and good prospects of getting our boss, Mr. Lee Davis, as one of our members.

Brothers, as this is my first effort, I hope you will not take offense at the way I write this. I will try and do better in the future.

G. R. LOCKHART, Press Secy.

#### UNION NO. 79, AUSTIN, TEX.

As I look through your dear little journal month after month and find no word from No. 79, I became a little uneasy, and thought your august majesty might think our boys had gone bathing in the dam lake and got froze in, as they say on old Lake Michigan. But, to tell the truth, No. 79 has not had a meeting since the first Monday in November. Good union boys, eh? Well, here goes for reasons, as far as I know them up to that time: Bro. Vorkafer had worked very hard to get the boys to hang together. By dint of coaxing, begging and hiring he could get enough to turn the switch on once a month. Then in December he changed jobs and switched himself and vice president out of town. He was in

the first of the year, but it did no good to call a meeting. He tried two days to get a quorum, but no go, so he left, and has been away since the 11th of January. On the 12th of February he wrote me that he is now 150 miles from a railroad, and in five days more would be 200, and does not know when he will reach Austin. He is not doing new work, only fixing up an old line, but he will have a new line of some distance to put up this summer.

Since my husband left home several communications from you came to the house which I thought should not be neglected longer. Also a notice to him from a Texas Senator that bill No. 81 was to have a hearing, and he wished the Electrical Union to be represented, telling him that he could have a hearing. As I have not kept up with legislation, I did not know the nature of bill 81, so after thinking it over, I took the letter to the secretary of No. 79. Well, I thought he would faint; so I got no satisfaction there, but nothing daunted, I formed myself into a committee of one, girded on my armor, and all the brass I could carry, and marched up to the big 60-acre capitol to look for the noble representative of Texas. I dodged around there the best part of three days, but could not find the right man, so I feel more ignorant now than ever, for I did not find a Senator that could tell me the nature of bill No. 81. Still, I fear that it was something that should have had the attention of the union, and if my husband had been here it surely would, for we are union to the core, and I tell you, there is no place on earth where union organizers are more needed than in this part of the South.

Well, tell the boys through the Worker to keep away from the Vaunted Capitol or Dam City. Not a thing doing here. Men idle half the time, except what few it takes to run the plants. Nothing doing on inside work. Telephone men on half time, and no prospect of better.

I hope you won't feel offended because this does not come from No. 79's regular Press Secy, but if the President were at home more, the boys would hear more often from No. 79 officially. Do not see much of them, and do not know why they do not show up in the Worker, only on the roll or Directory. Now, if you say anything of this, you can sign it Bill 81 for want of a name. I will let you hear from me again soon, as I have a problem that I wish explained.

BILL 81.

Penn Yan, N. Y.—An electric road will be built from this city to Branchport. Work will begin in the spring.

Chicago, Ill.—The Council Committee has approved an ordinance allowing the Calumet Electric Street Railway Company to extend its lines on Erie avenue, from Ninety-third street to South Chicago avenue.

Baltimore, Md.—According to a local paper, the B. & O. Ry. Co. will establish lighting plants in the principle depots of their system. In Philadelphia the plant will be located in the Twenty-fourth Street Station, and will furnish lights for the Race street yards, coal piers and round house.

## Directory of Local Unions.

(Secretaries will please furnish the necessary information to make this directory complete. Note that the time and place of meeting, the name of the President, the names and addresses of the Recording and Financial Secretaries are required.)

No. 1, St. Louis, Mo.—Meets every Tuesday at s. e. cor. 21st and Franklin avenue. M. L. Durkin, Pres., 2223 Wash st.; John Hisserich, R. S., 1827 N. 22d st.; J. P. Casey, F. S., 2702 Spring av.

No. 2, Milwaukee, Wis.—Meets every Friday at 318 State st. W. A. Gerarden, Pres., 457 Broadway; Chas. Herman, R. S., 1805 Walnut st.; Joe Harris, F. S., 448 Russell ave.

No. 3, Denver, Col.—E. L. Layne, Pres., 1011 19th st.; Geo. P. Manning, Sec., 1633 Lawrence st.

No. 4, New Orleans, La.—Meets 1st and 3d Tuesdays at Carondelet and Perdido sts. J. McGregory, Pres., 2111 Rousseau st.; C. M. Hale, R. S., 630 St. Mary st.; R. B. Joyce, F. S., 331 S. Bassin st.

No. 5, Pittsburgh, Pa.—T. K. Bevington, Pres., 19 Race st.; Allegheny: H. McGregor, R. S., Nesbit & Allequippa sts.; Y. Bevington, F. S., 5621 Margretta st.

No. 6, San Francisco, Cal.—Meets 2nd and 4th Wednesdays at Forester's Hall, 20 Eddy st. A. C. Johnson, Pres., 226 Turk st.; J. J. Cameron, R. S., 1510 Mission st.; J. R. Fulton, F. S., 428 Geary st.

No. 7, Springfield, Mass.—Meets every Wednesday at room 14 Barnes Bldg. Wm. Gregg, Pres., 107 Bancroft st.; T. H. Bowen, R. S., 26 Hubbard av.; Jos. McGilvray, F. S., 34 Gray av.

No. 8, Toledo, O.—Meets every Tuesday at Friendship Hall, cor. Jefferson and Summit sts. P. Crowley, Pres., 848 W. Lafayette st.; E. McGinn, R. S., 235 Western ave.; W. H. Welsh, F. S., 1907 Cherry st.

No. 9, Chicago, Ill.—Meets every Saturday at 106 E. Randolph st. A. F. Snider, Pres., 3433 State st.; L. Christenson, R. S., 1043 S. Irving ave.; A. McFarlane, F. S., 5657 Princeton av.

No. 10, Indianapolis, Ind.—Meets 1st and 3rd Monday at 29½ W. Pearl st. John Berry, Pres., care of headquarters Fire Dept.; E. Bussele, R. S., 487 N. Illinois st.; E. C. Hartung, F. S., Rooms 5-7 Cyclorama Bldg.

No. 11, Terre Haute, Ind.—Meets 2d and 4th Tuesdays at 8th and Main sts. C. D. Updegraff, Pres., 525 S. Ninth st.; M. Davis, R. S., 918 N. 9th st.; W. H. Schaffer, F. S., 114 N. 14th st.

No. 12, Evansville, Ind.—Meets every Tuesday at cor. 3rd and Sycamore st. Harry Fisher, Pres., 20 Clark st.; A. L. Swanson, R. S., 1054 Water st.; A. N. Grant, F. S., 202 Clark st.

No. 14, Memphis, Tenn.—Chas. E. Blake, Pres., 70 Mulberry st.; J. A. Myles, Sec., 207 De Soto st.

No. 13, Philadelphia, Pa.—Meets every Tuesday at 711 Spring Garden st. E. G. Boyle, Pres., Penn. Farmers' Hotel, 3d and Callowhill sts.; E. Hennessy, R. S., 1518 French st.; Chas. T. Lang, F. S., 829 Race st.

No. 16, Lynn, Mass.—Meet at General Electric Band Room, 9½ South st. Jas. Robson, Pres., 46 W. Neptune st.; C. W. Perkins, R. S., 6 Allen's Court; E. J. Malloy, F. S., 86 Cottage st.

No. 17, Detroit, Mich.—Meets 1st and 3d Thursdays at Room 8 Hilsendegen Block. W. J. Donovan, Pres., 112 Chestnut st.; Geo. H. Brown, R. S., 50 Lewis st.; P. F. Andrich, F. S., 369 Chene st.

No. 18, Kansas City, Mo.—Meets 2d and 4th Fridays at 1117 Walnut st. J. J. Lynch, Pres., 716 Delaware st.; C. F. Drollinger, R. S., 326 Garfield av.; Kansas City, Kas.; J. H. Lynn, F. S., 1632 Jefferson st.

No. 19, Chicago, Ill.—Meets 1st and 3d Tuesdays at 6512 Cottage Grove av. M. J. Sullivan, Pres., 4951 Princeton av.; G. W. Richart, R. S., 5610 S. Halsted st.; D. Pearce, F. S., 3540 Wentworth av.

No. 21, Wheeling, W. Va.—Meets 1st and 3d Tuesdays at Trades Assembly Hall. H. F. Wyse, Pres., Box 111; C. L. Uillery, R. S., Box 111; W. J. Clark, F. S., McClure House.

No. 22, Omaha, Neb.—Meets every 1st and 3d Wednesdays at Labor Temple, 17th & Douglas st. J. W. Waters, Pres., 2211 Pierce st.; M. J. Curran, R. S., 1814 St. Mary's av.; W. J. Wales, F. S., 1804 Farnum st.

No. 23, St. Paul, Minn.—Meets 2d and 4th Fridays at Labor Hall, 3rd and Wabasha sts. Jno. O'Donnell, Pres., 4th and Wabasha sts.; Thos. O'Toole, R. S., 333 E. 6th st.; F. Volk, F. S., 175 W. 6th st.

No. 24, Minneapolis, Minn.—Meets 1st and 3rd Wednesdays at 34 and 36th st. S. Geo. Heilig, Pres., 18 9th st.; L. R. Stevens, R. S., 18 Western av.; A. Aune, F. S., 3129 Longfellow av.

No. 25, Duluth, Minn.—Meets 2d and 4th Thursdays at room 6 Banning Bldg. R. Thayer, Pres., 24 Third ave. W.; L. P. Runkle, R. S., 17 Norris Bldg.; Jas. F. Owens, F. S., 414 E. 1st st.

No. 26, Washington, D. C.—Meets every Monday at 508 11th st. N. W. Jos. Patterson, Pres., 1127 12th st. N. E.; S. M. Wilder, R. S., 514 3rd st. N. W.; R. F. Metzler, F. S., 509 11th st. N. W.

No. 27, Baltimore, Md.—Meets every Monday at Hall, cor. Fayette and Park avs. C. F. Leitz, Pres., 506 S. Pulaski st.; J. P. Jones, R. S., 1414 Mosher st.; F. H. Russell, F. S., 1408 Asquith st.

No. 28, Louisville, Ky.—Meets 1st and 3d Tuesdays at Beck Hall, 1st st. near Jefferson Calvius Beach, Pres., 1020 W. Market st.; Ed. Herpt, R. S., 607 Magnolia st.; Jno. C. Deibel, F. S., 418 15th st.

No. 29, Atlanta, Ga.—Meets every Sunday at 61½ Alabama st. Geo. Foster, Pres., 100 Walker st.; D. J. Kerr, R. S., 114 Richardson st.; Geo. Raymer, F. S., 121 Rhodes st.

No. 30, Cincinnati, O.—Meets 1st and 3d Mondays at 136 E. Court st. W. Williams, Pres., 26 Mitchell ave.; Mt. Auburn; H. C. Genrich, R. S., 225 W. Court st.; J. F. Harmuth, F. S., 2158 Vernon st., Clifton Heights.

No. 31, Jersey City, N. J.—Meets 2d and 4th Thursdays at 116 Newark av. Thos. Watson, Pres., 513 Jersey av.; F. J. Anderson, R. S., 228 Washington st.; T. L. Jones, F. S., 137 Grand st.

No. 32, Paterson, N. J.—Meets 1st and 3d Mondays at German Union Hall. J. F. Colvin, Pres., 963 Madison av.; Jos. Maher, R. S., 348 Grand st.; Paterson Heights, Paterson, N. J.; John Kane, F. S., 274 Hamilton av.

No. 35, Boston, Mass.—Meets every Wednesday at Well's Memorial Hall, 987 Washington st. J. Larkin, Pres., 13 Cambridge st.; D. McGilvray, R. S., 7 Humboldt Park, Roxbury; R. H. Bradford, F. S., 14 Pleasant st., Cambridge.

No. 36, Sacramento, Cal.—J. A. Crombach, Pres., 1613 4th st.; E. G. Fletcher, R. S., 505 J st.; Gus. Flanagan, F. S., 530 M st.

No. 37, Hartford, Conn.—Meets 1st and 3d Fridays at Central Union Labor Hall, 11 Central Row. M. F. Owens, Pres., 63 Hawthorne st.; D. F. Cronin, R. S., 49 Windsor st.; C. E. Byrne, F. S., 16 John st.

No. 38, Cleveland, O.—Meets every Thursday at 393 Ontario st. R. M. Ross, Pres., 33½ Colgate st.; Tom Wheeler, R. S., 378 Franklin av.; J. E. Suloff, F. S., 26 Norton st.

No. 39, Providence, R. I.—Meets 1st and 3d Mondays at Phoenix Bldg, 157 Westminster st. H. B. Kelly, Pres., 1950 Westminster st.; M. L. Carder, R. S., 40 Wilson st.; G. D. Higgins, F. S., 8 Carpenter st.

No. 40, St. Joseph, Mo.—Meets every Monday at north-west corner 8th and Locust sts. "Brockaw's Hall." R. M. Martin, Pres., 1702 N. 3d st.; Wm. Dorsel, R. S., 1710 Calhoun st.; F. A. Dunn, F. S., 426 Ed. st.

No. 41, Philadelphia, Pa.—Geo. A. Neal, Pres., 3626 Wharton st.

No. 43, Syracuse, N. Y.—F. A. Chadwick, Pres., 108 Roberts ave.; G. A. Davenport, R. S., 553 Seymour st.; Chas. A. Miller, F. S., 906 Montgomery st.

No. 44, Rochester, N. Y.—F. M. Kehoe, Pres., 21 Costar st.; Wm. A. Breese, R. S., 36 4th st.; Fred Fish, F. S., 123 State st.

No. 45, Buffalo, N. Y.—Meets 1st and 3d Saturdays at Council Hall. Wm. Haley, Pres., 125 Erie st.; Chas. Guyton, R. S., 124 Swan av.; C. E. Stinson, F. S., 298 Carolina st.

No. 46, Lowell, Mass.—M. J. Burns, Pres., Police Dept.; Thos. Dalton, R. S., 368 Concord st.; H. E. Maguire, F. S., 95 Christian st.

No. 47, Worcester, Mass.—C. C. Coghlin, Pres., 113 West st.; Geo. R. Lincoln, Sec'y, Millbury.

No. 48, Ft. Wayne, Ind.—Meets 1st and 3d Fridays at cor. of Main and Clinton sts. R. Bartel, Pres., Hotel Tremont; A. J. Lathouse, R. S., 148 Wells st.; G. B. Taylor, F. S., 31 Douglas av.

No. 49, Bloomington, Ill.—Meets 2d Monday at Trades Assembly Hall. C. F. Snyder, Pres., Box 328; Guy Carlton, R. S., East and Market sts.; W. C. Gorey, F. S., 409 S. Madison st.

No. 51, Scranton, Pa.—Jas. Harding, Pres., 601 Meridian st.; P. Campbell, R. S., 1210 Irving av.; Ruben Robins, F. S., 1223 Hampton st.

No. 52, Davenport, Ia.—Meets 1st and 3d Tuesday; A. L. Wheeler, Pres., Hotel Downs; J. H. Clark, Sec., 215 Iowa st.

No. 53, Harrisburg, Pa.—C. A. Swager, Pres., 115½ Market st.; Jas. Emminger, R. S., 25 N. 15th st.; C. Anderson, F. S., 46 Summit st.

No. 54, Peoria, Ill.—Meets 1st and 3d Wednesdays at 301 Main st. H. Scheerer, Pres., 219 W. Jefferson st.; Harry Dunn, R. S., East Peoria; L. C. Crawley, F. S., 115 Washington st.

No. 57, Salt Lake City, Utah.—R. Blair, Sec'y, care of Citizens F. L. Co.

No. 60, San Antonio, Tex.—Meets 1st and 3d Saturdays, Meyers' Hall, Alamo Plaza. Martin Wright, Pres., 114 Romania st.; E. Kuhlman, R. S., 222 Salina st.; W. F. Hendricks, F. S., 722 Mosquite st.

No. 61, Los Angeles, Cal.—C. P. Lofthouse, Pres., 746 San Julian st.; F. W. Messacar, R. S., Station A; W. K. Kingston, F. S., 119 Kern st.

No. 62, Kalamazoo, Mich.—A. D. Ayres, Pres., 534 S. Burdick st.; L. Bellman, R. S., 540 Pine st.; G. E. Tift, F. S., 324 Sarah st.

No. 63, Tampa, Fla.—Theo. Glinn, Pres., Ft. Tampa City; W. F. Crofts, R. S., lock box 264; Arthur D. Henry, F. S., box 220.

No. 65, Butte, Mont.—Meets 1st and 3d Sundays in Good Templars Hall, W. Broadway. Vic Poissant, Pres., with Mont. Elect. Co.; D. J. Winslow, R. S., 103 E. Granito st.; A. G. Ellerick, F. S., General Del.

No. 66, Houston, Tex.—Meets every Monday. G. O. Wood, Pres., 1214 Providence st.; A. H. Stelle, R. S., 12 Main st.; W. V. Fisk, F. S., care Telephone office.

No. 67, Quincy, Ill.—Meets 2nd and 4th Wednesdays at Trades Assembly Hall, So. 5th st. W. F. Wagner, Pres., 641 Locust st.; E. W. Nessler, R. S., 602 Sixth ave. S.; D. M. Mallinson, F. S., 1120 Vine st.

No. 68, Little Rock, Ark.—C. W. Wilson, Pres., care Brown Machine Co.; C. J. Griffith, R. S., care L. R. Tract. & El. Co.; W. N. Drogoun, F. S., 1509 W. 3d st.

No. 69, Dallas, Tex.—Meets 1st and 3rd Saturday at Labor Hall. S. D. Claiborne, Pres., 141 San Jacinto st.; W. H. Young, R. S., 190 Beaumont st.; F. G. Montgomery, F. S., 190 Collins st.

No. 70, Schenectady, N. Y.—Meets 2d and 4th Tuesdays at Trades Assembly Hall, cor. Centre and State sts. F. Litzendorf, Pres., Crane st.; Mt. Pleasant; W. A. Birch, R. S., 603 Liberty st.; J. D. Betting, F. S., 626 Villa road.

No. 71, Galveston, Tex.—Meets 2d and 4th Wednesdays. J. T. Payne, Pres., 1314 Centre st.; F. J. Schallert, R. S., 2514 Church st.; G. L. Garrett, F. S., 2108 A. V. L.

No. 72, Waco, Tex.—Meets 2d and 4th Wednesdays at Labor Hall. M. F. Wortham, Pres., 912 S. 6th st.; Jos. Hodges, Sec'y, 912 S. 6th st.

No. 73, Spokane, Wash.—Meets 1st and 3rd Thursdays at Oliver Hall, 336½ Riverside av. Gus Benson, Pres., 504 Nichols Block; T. H. Denter, R. S., box 635; C. C. Van Inwegen, F. S., 107 Howard st. S.

No. 74, Fall River, Mass.—Meets every Monday at cor. Main and Bedford sts. W. I. White, Pres., 59 Bowen st.; Jas. Murphy, R. S., 100 4th st.; Thos. Bailey, F. S., 135 Snell st.

No. 75, Grand Rapids, Mich.—Meets 1st and 3d Fridays. J. O. Aldrich, Pres., care City Fire Dept.; F. M. Ruck, R. S., 16 W. Broadway; G. H. Higgins, F. S., 63 Pleasant st.

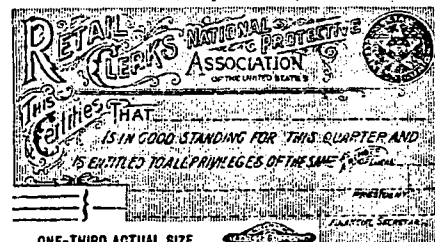
No. 78, Saginaw, Mich.—Jas. Hodgins, Pres., 308 N. Franklin st.; John Strachan, R. S., 336 N. 2nd st.; Chas. Ross, F. S., P. O. box 225, E. S.

No. 79, Austin, Tex.—Meets every Thursday night at Maccabee Hall. J. L. Vorkauer, Pres., 1206 San Jacinto st.; Chas. J. Jackson, R. S., Mayor's office; B. Y. Lovejoy, F. S., 109-111 E. 7th st.

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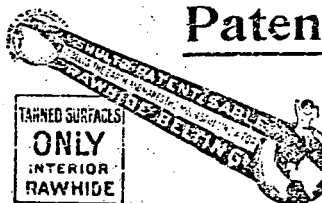
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